

JAMAICA

ANNUAL REPORT

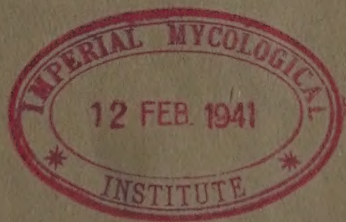
OF THE

DEPARTMENT OF SCIENCE AND AGRICULTURE

FOR THE

PERIOD 1st JANUARY, 1939 TO 31st MARCH, 1940.

Ordered by His Excellency the Governor to be Printed.



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CONTENTS.

PAGE.

PRIMARY OF AGRICULTURAL POLICY.

SECTION I.—AGRICULTURE IN THE COLONY.

SECTION II.—WORK OF THE DEPARTMENT OF AGRICULTURE.

A. PUBLIC GARDENS:

(i) Report of the Superintendent Public Gardens and Horticulturist.	..	..	3
---	----	----	---

B. AGRICULTURAL EXPERIMENTS, EDUCATION AND FIELD SERVICES:

(ii) Report of Superintendent, Experiment Station, Hope.	..	..	4
(iii) Report of Superintendent, Sugar Cane Experiments.	..	..	4
(iv) Report of Headmaster, Jamaica School of Agriculture	..	..	5
(v) Report of Farm Superintendent.	..	..	6
(vi) Report of Agricultural Superintendent, Government Stud Farm and Experimental Station, Manchester.	..		7
(vii) Report of Senior Veterinary Officer.	..	..	8
(viii) Report of Conservator of Forests	..	..	9
(ix) Report of Supervising Inspector of Plant Diseases.	..	..	15
(x) Report of Acting Agricultural Superintendent.	..	..	15
(xi) Report of Crop Development Officer.	..	..	15
(xii) Report of Chief Inspector of Produce.	..	..	16

C. RESEARCH AND LABORATORIES:

(xiii) Report of Government Chemist.	..	..	16
(xiv) Report of Entomologist.	..	..	18
(xv) Report of Agricultural Chemist.	..	..	20
(xvi) Report of Government Botanist.	..	..	21
(xvii) Report of Plant Pathologist.	..	..	22
(xviii) Report of Leaf Spot Control Officer.	..	..	23

D. PUBLICATIONS:

List of Departmental Publications issued.	..	..	24
---	----	----	----

SECTION III.—LEGISLATION—

Summary of Legislative Changes affecting Agricultural Industries.	..	..	24
---	----	----	----

APPENDICES.

FOOD PRODUCTION:

(a) Report of Secretary Food Control Board	25
(b) Report of Live Stock Officer.	25
Report of Sugar Control Board.	27

INDEX.

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K.				Page.	Q			
King's House Gardens	..	..	..	3	Quarantine Station, Animal	..	..	..
Kingston Public Gardens	..	..	..	3	Quarantine Station, Trinidad	..	..	..
L.					R.			
Laboratory Fees	..	..	..	18	Racehorses	..	..	..
Laboratory Sales	..	..	..	18	Rainfall (See also Weather)	..	..	..
Labour Force	..	..	..	10	Reafforestation of Liguanea Ridge	..	..	..
Leaf Spot Control Board	..	..	..	2, 15, 23	Red Peas	..	..	..
Leaf Spot Control Division	..	..	..	2, 20, 23	Registration of Cane Farmers	..	..	..
Leaf Spot Disease (See <i>Cercospora</i> Leaf Spot)	..	..	..		Registration of Pure Bred Cattle	..	..	..
Lectures and Demonstrations	..	..	..	8, 18	Rice	..	..	..
Legislation, Agricultural	..	..	..	16, 24	Rum Control Board	..	..	..
Lighting System, Grove Place	..	..	..	7				
Limes	..	..	..	15				
Licences, Forestry	..	..	..	10				
Licences, Produce	..	..	..	16				
Livestock:								
At Grove Place	..	..	..	7	Sales, Garden	..	..	..
At Hope Farm	..	..	..	6	Sales, Laboratory	..	..	..
Diseases	..	..	..	8	Sales of Livestock	..	..	..
Exports	..	..	..	8	Sanitary Improvements, Grove Place	..	..	..
Imports	..	..	..	8, 26	Scales, Testing of	..	..	..
Improvement Centres	..	..	..	3, 8, 26	Seed Corn Improvement (See Maize)	..	..	..
Improvement Programme	..	..	..	3, 25	Seed Potatoes imported	..	..	..
Poisoning	..	..	..	8	Seymour Grass	..	..	..
Sales	..	..	..	6, 7	Silage	..	..	..
M.								
Mahoe	..	..	..	9	Slaughter Houses	..	..	..
Mahogany	..	..	..	9	Soils	..	..	..
Maize	..	..	..	7, 20, 21, 22	Solar Propagators	..	..	..
Mango	..	..	..	4, 15, 19, 22	Soya Beans	..	..	..
Manurial Experiments:					Stamp Duty	..	..	..
Citrus	..	..	..	7, 15, 20	Stud Services	..	..	..
Food Crops	..	..	..	20	Sugar—			
Sugar Cane	..	..	..	5, 20	Agreement International	..	..	..
Matterson, Hugh	..	..	..	3	Control Board	..	..	..
Meat Supply	..	..	..	8	Exports	..	..	..
Military Service	..	..	..	5, 6, 26	Factories	..	..	..
Milk Condensary	..	..	..	3, 8	Preference Certificates	..	..	..
Milk Production	..	..	..	6	Production	..	..	..
Milk Room, New	..	..	..	6	Quota	..	..	..
Milk Sales	..	..	..	6	Wet	..	..	..
Mules	..	..	..	7	Sugar-Cane:			
Mushroom Spawn, imported	..	..	..	19	Cultivation	..	..	..
Museum of Building Industry	..	..	..	18	Diseases	..	..	..
N.								
Nestles, Ltd.	..	..	..	3	Distributions	..	..	..
Nurseries, Forestry	..	..	..	9	Experiments	..	..	..
Nurseries, Citrus	..	..	..	15	Pests	..	..	..
Nutrition Scheme	..	..	..	2	Prices	..	..	..
O.								
Orange, Bitter	..	..	..	15	Testing of Scales	..	..	..
Orchids	..	..	..	3	Varieties	..	..	..
P.								
Packing Houses	..	..	..	2, 16	Yields	..	..	..
Panama Disease (See <i>Banana</i>)	..	..	..		Summer Course	..	..	..
Paranaph Boilers	..	..	..	18	<i>Swietenia macrophylla</i>	..	..	..
Paranaph Sales	..	..	..	9, 18	<i>Swietenia mahogani</i>	..	..	..
Pasture Crops	..	..	..	26				
Pear (See also <i>Avocadoes</i>)	..	..	..	15				
Peanuts (See <i>Groundnuts</i>)	..	..	..					
Peat Moss (imported)	..	..	..	19				
Pedigree Certificates	..	..	..	6				
Pengelley, Dr. C.	..	..	..	3				
Pigs, importation of	..	..	..	7, 26				
Pimento	..	..	..	2, 16, 19, 22				
Pineapple Mealy Bug	..	..	..	21				
<i>Pinus Massoniana</i>	..	..	..	9				
<i>Pithecolobium arboreum</i>	..	..	..	9				
<i>Plaesius javanus</i>	..	..	..	19				
<i>Podocarpus elongatus</i>	..	..	..	9				
Poisoning of Livestock	..	..	..	8				
Potato, Irish	..	..	..	20, 22				
Potato, Sweet	..	..	..	7, 15, 20				
Poultry	..	..	..	6				
Produce Board	..	..	..	16				
Produce exports	..	..	..	16				
Produce Inspection	..	..	..	16				
Produce Law	..	..	..	16				
Produce Licences	..	..	..	16				
Publications	..	..	..	18, 24				
Puerto Rico	..	..	..	3, 10				
					T.			
					Teak (<i>Tectona grandis</i>)	..	..	..
					Termite Control Bureau	..	..	..
					Tick Control	..	..	..
					Timber, Imports and Exports	..	..	..
					Tobacco	..	..	..
					Tomato	..	..	..
					Tractor, Diesel-engined	..	..	..
					Trinidad Quarantine Station	..	..	..
					U.			
					Uba Cane as Feed	..	..	..
					<i>Urechites suberecta</i>	..	..	..
					U.S.A.	..	..	..
					V.			
					Vale Royal Factory	..	..	..
					Valuation of Livestock	..	..	..
					Vegetables, imported	..	..	..
					Veterinary Education	..	..	..
					W.			
					War Department Lands	..	..	..
					Water Commission Lands	..	..	..
					Water Lilies	..	..	..
					Weather	..	..	1, 4, 6, 7,
					Weevil Borer, predators of	..	..	..
					Wet Sugar	..	..	..
					Wild Life, Protection of	..	..	..
					Wild Tamarind	..	..	..
					Y.			
					Yacca	..	..	..

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17 Temporary Instructors	
3 Clerks	
1 Stenographer	

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*Employees of B.L.S.C. Board.



DEPARTMENT OF SCIENCE AND AGRICULTURE.

Report for the Period 1st January, 1939, to 31st March, 1940.

SUMMARY OF AGRICULTURAL POLICY.

The Government's agricultural policy has been largely determined by conditions existing as a result of the movement of the Empire in war. For the duration of hostilities the main considerations will be:—

- Provision of an adequate food supply for the population by—
 - (a) encouraging increased production of grains, cereals, vegetables, etc., which are already grown to some extent in the Island;
 - (b) improving these food crops by revised cultural methods, and introduction of new varieties to supplement those already under cultivation;
 - (c) improving the standard of livestock farming with regard to beef and dairy cattle, small stock and poultry.
- Preservation of the main industries of the Colony—banana, sugar, etc., by attention to problems of cultivation, and disease control, etc.
- Production of export crops additional to the main industries—permanent orchard crops, minor fruit and vegetables.
- Maintenance of the standard of the colony's agricultural exports by a rigid system of inspection of all produce.
- Quarantine inspection of imported animals, plants, etc., to protect against introduction of pests or diseases which may affect the agriculture of this colony.
- Conservation of soil by:—
 - (a) a programme of afforestation of steep slopes and protection of forest reserves,
 - (b) encouragement of proper anti-erosion farm practices—contour cropping, terracing, etc.
- Education of the people in agriculture with the co-operation of the Jamaica Agricultural Society, Education Department, and other official and semi-official bodies by well planned propaganda.
- The carrying on of fundamental research already initiated as far as possible; new investigations will be taken only when absolutely essential.

SECTION I.—AGRICULTURE IN THE COLONY.

The present report presents some features absent from previous ones. In the first place it covers the period January, 1939 to 31st March, 1940, as a consequence of Government's decision to make annual reports equivalent to that for 1938 treat with the same period as the financial year.

It was to be expected that the outbreak of hostilities in Europe would affect the agriculture of the Colony. New activities have developed as a result of the Empire being at war, whereas progress in others has either stopped or retarded.

Another factor affecting agricultural production in the period under review is the unusual weather experienced throughout most of 1939. Though total rainfall figures are in excess of the average annual total for the last 60 years, production was extremely poor. There was continued drought over almost the entire Island from March to May, followed by flood rains and a hurricane at the beginning of November.

The destruction of crops was severe; 75% of the bearing banana trees were uprooted and considerable damage done to younger plants as well. Other crops—citrus, coconut, sugar cane, breadfruit, yam—all sustained loss but not to the same extent as the more easily destroyed banana.

The value of the Island's agricultural exports declined in 1939, and was nearly £300,000 less than in 1938. This decrease would have been greater if it were not for an appreciation in the value of nearly all commodities. Bananas which realised an average of 245/- per 100 stems f.o.b. in 1938, were sold in 1939 for 259/-, and sugar advanced in price by £2 per ton from £7 10s. 0d. to £9 10s. 0d.

THE BANANA INDUSTRY.

Total Banana exports in 1939 were less than 19 million stems and in the first three months of the current year under half a million stems.

The losses to the industry due to pests and diseases have continued to receive the attention of the officers of the Department. Predators of the weevil borer have been introduced and are being successfully established in areas where bananas are grown extensively. They show promise of effecting control of this pest.

The efforts of 20 Inspectors of Plant Diseases are directed primarily towards the treatment of Panama Disease. In addition, research is always being carried on by the Specialist Officers to determine methods of control. So-called "cures" are investigated continually. In the meantime the work of breeding an immune commercial variety of banana goes on.

The seriousness of the threat of the Cercospora Leaf Spot Disease led to the formation of a separate Division of this Department in July, 1939. A report of its activities is given elsewhere as well as those of the Leaf Spot Control Board which is responsible for the administration of the free Government grant of £200,000.

The original scheme for fertilizer investigations was concluded and a report published. By means of the investigations valuable indications were obtained as to the correct procedure for fertilizer treatment with banana.

SUGAR.

The Island sugar quota for the 1938-39 crop was fixed originally at 94,390 tons with an export quota of 80,300 tons. Total production amounted to nearly 118,000 tons and the export quota was increased to 109,960 tons. Actual exports amounted to nearly 106,000 tons at an average price of 190/- per ton f.o.b.

The quota for Island production in the 1939-40 season was fixed as follows:—

Island Export Quota	..	102,000 tons
Island Local Consumption Quota	..	16,000 tons
Island Reserve Quota	..	10,000 "
Island Muscovado Quota	..	100 "

One effect of the war has been to render the International Sugar Agreement almost inoperative. The Colony has been permitted to exceed the quota by 20% and the entire sugar crop has been purchased beforehand by the United Kingdom Food Controller.

CITRUS.

The 1939 citrus crop was the highest on record as shown by the high export figure of nearly half a million boxes. From indications of the three months January to March this year, it is unlikely that production will attain the same level during 1940. The comparatively new trade established with New Zealand was more than maintained with shipments of grapefruit and oranges.

There has been marked improvement in the reaping, transportation and general handling of citrus fruit resulting in a reduction in wastage and an increase in value. The installation of colour adding equipment in all commercial packing houses has assisted materially in ensuring uniformity and attractiveness in the appearance of Jamaican citrus fruit.

PIMENTO.

The position occupied by pimento in the colony's agricultural industry has always been of prime importance. The rust disease was not so much in evidence during the period under review and recovery has been remarkable in some areas. Over 8 million pounds were exported in 1939 at remunerative prices. These have remained so in spite of the elimination of the main market—Germany—at the outbreak of hostilities.

COCONUTS.

Owing to the increasing alarm with which planters regarded the spread of coconut wilt, fears were entertained for the industry and Mr. F. M. Bain of the Trinidad Department of Agriculture was invited to Jamaica to report on conditions here. He found the disease to be identical with the "Bronze Leaf Wilt" so well known in other coconut growing countries and made recommendations for its treatment by the adoption of better cultural methods and the application of fertilizers where necessary. His findings have been published in pamphlet form.

OTHER CROPS.

Investigational work on minor field crops under the Nutrition Scheme has been continued and much useful information obtained on varieties and methods of cultivation of cereals, pulses and cover crops.

Studies on tropical orchard crops were also started in March, 1939, with the object of developing improved types suitable for export.

A corn breeding and selection plan was commenced last autumn. The main purpose is the production of a good milling variety of greater colour uniformity than the strains commonly grown at present. In spite of adverse weather and the ravages of insect pests progress has been reported.

FOOD PRODUCTION.

The Food Production Board was appointed in August, 1939, when it was almost certain that the Empire would become involved in war. Its primary object is to promote the local production of foodstuffs, particularly cereals and pulses with a view to rendering the colony as far as possible independent of imported supplies.

A scheme whereby growers are guaranteed a fixed price by Government for their produce is at present in operation. For the purpose, however, it is required that acreages be registered with the Board. Nearly 80,000 acres were registered for different food crops up to 31st March, 1940.

In order that the progress of the Food Production Scheme should not be retarded by lack of funds on the part of growers additional facilities for agricultural credit have been provided through the system of Agricultural Loan Banks already in existence by increasing the number of banks and by a sum of £100,000 being made available by Government to the Agricultural Loan Societies Board for allotment to District Loan Banks for advances on loan to growers of food crops.

LIVESTOCK.

Associated with the Food Production Campaign is the Livestock Improvement Programme. This was started to provide facilities for improving the breed of local farm animals, both with regard to dairy and meat production. It was decided to establish throughout the Island a number of Livestock Improvement Centres at which the seed of good sires could be obtained free by persons raising livestock. There have been 39 such Centres established at several of them well bred stud animals of cattle, goats, pigs and sheep are maintained.

At the Hope Stock Farm and Grove Place Experiment Station the work of selecting a dairy animal suitable for local conditions has been continued and research in scientific feeding with locally produced fodder has played an important part in the carrying out of long term experiments.

The report of the Senior Veterinary Officer gives an account of the present position of animal husbandry in the Colony; therein may also be found details of the common diseases of livestock in this Island.

A Milk Condensary has recently been erected at Bog Walk by Messrs. Nestles Ltd. and preliminary operations begun in March, 1940. The establishment of this factory will provide an additional impetus to the improvement of the dairy industry as it will create a steady demand for milk produced in the Island.

JAMAICA SCHOOL OF AGRICULTURE.

The name of the Government Farm School was changed in 1939 to the Jamaica School of Agriculture. The popularity of this school is increasing and the demand for a sound practical agricultural education is extending.

FORESTRY.

The activities of the Forestry Division of the Department have been extended considerably since 1938. The acquisition of land for forest reserve proceeds at a rapid rate and up to the end of the period under review there were 300,000 acres administered by the Division. Additional afforestation programmes were undertaken with the primary aim of conservation of soil and water supplies. Facilities were afforded the Forest Officer to visit Puerto Rico and the United States of America during 1939.

G. A. JONES,
Director of Agriculture.

SECTION II.—WORK OF THE DEPARTMENT OF AGRICULTURE.

A. PUBLIC GARDENS.

(i) Report of the Superintendent and the Horticulturist.

1. HOPE GARDENS.

There was a splendid display of Orchid blooms especially during May and June when a large number of the seedlings flowered. The variety Prince John was of outstanding merit. The work of raising hybrid seedlings has been resumed.

A collection of Water Lilies presented by Mr. S. C. Black of Widcombe, Liguanea P.O. was added to the Gardens, a small collection of Jamaica Fresh-water Fish as well as some imported varieties was presented by Dr. C. Selley of Tremorn, Mandeville for the Aquarium.

One Hundred Coconuts of the Ornamental Red and Yellow varieties were received from Mr. Hugh Matterson, Miami, Florida, and have been planted in the Nursery.

Four Solar Propagators were constructed in the Nursery for propagating soft-wooded cuttings. Very satisfactory results are being obtained from these propagating frames.

The old wooden gate at the main entrance to Hope Gardens was replaced with iron gates which were previously at the Old Court House Site adjoining the Parade Gardens, Kingston.

The narrow bridge on the main entrance driveway which crosses the water canal passing through the Gardens was widened and an ornamental balustrade constructed on both sides.

A total of 56,672 plants were distributed during the period under review. Of this number 43,111 were sold and 13,561 were free grants.

2. CASTLETON GARDENS.

The hurricane which passed near the Island on the 1st and 2nd November, 1939, left these Gardens in a very damaged condition, but fortunately no trees or shrubs of rare botanical interest were completely destroyed by the winds.

Plants of the Japanese Bamboo were planted along the river bank in the Lower Garden as a protection against flood rains which are constantly cutting into the bank.

A total of 9,310 plants were distributed during the period under review. Of these 1,107 were sold and 8,203 transferred to the Hope Gardens Nurseries.

3. KING'S HOUSE GARDENS.

The Pergola leading to the lily pond was reconstructed by the Public Works Department and an ornamental fountain erected in the centre of the Pond.

4. KINGSTON PUBLIC GARDENS, CINCHONA HILL GARDENS, BATH GARDENS, GORDON TOWN GARDEN. These Gardens continued to be maintained by the Department during the period under review.

5. RAINFALL.

The Rainfall at the various Gardens for the period under review is as follows:—

Hope Gardens.	Castleton Gardens.	King's House Gardens.	Public Gardens, Kingston.	Hill Gardens, Cinchona.
Ins.	Ins.	Ins.	Ins.	Ins.
75.66	197.57	56.62	46.96	108.37

6. SALES.

The Garden Sales for the period under review amounted to £374 11s. 1d.

M. S. GOODMAN,
Superintendent of Public Gardens.
E. J. DOWNES,
Government Horticulturist.

B. AGRICULTURAL EXPERIMENTS, EDUCATION AND FIELD SERVICES.

(ii) Report of the Superintendent Experiment Station, Hope.

Weather—The Rainfall at the Station for the 15 months January, 1939 to March, 1940, was 75.66 inches is above the average for the past 58 years. For the three months September, October and November, a deposit of 50.64 inches was registered of which 30.58 fell in November as a result of a weather disturbance which passed to the Island and only 25.02 inches were recorded for the remaining twelve months of the period under review.

Distribution of Cane Varieties—During the period under review 376,407 tops and cuttings of the different varieties of Sugar Cane were distributed. This is the largest number distributed for many years. Of this 75,800 were sent out from the Cornwall Nursery, Westmoreland, where only highly resistant varieties are grown for distribution to the small cane farmers who are diffident in roguing Mosaic Disease in their fields.

Cane Varieties—Several new varieties, some of them bred specially for conditions existing in Jamaica, have been received from the Cane Breeding Station, Barbados, through the Trinidad Quarantine Station. These seedlings are in various stages of propagation at the Cow Park Nursery where conditions are more favourable than at Hope owing to the prevalence of Mosaic Disease at the latter Station. After multiplication at the Cow Park Nursery the seedlings are tested out at Hope for Mosaic resistance. Very few of the new varieties that have been so far received can be claimed to be highly resistant.

The following varieties from previous introductions have been discarded on account of their susceptibility to Mosaic Disease, poor juice and little likelihood of giving good field performances: B.34129, B.34120, B.34134, B.35237, B.35176, B.3127, B.34130 and B.3234.

The varieties F.C.916 and M.P.R.28 are giving good returns in several cases, remaining practically free from Mosaic and proving very suitable for making wet sugar.

Citrus—The budding of Valencia Orange plants for sale to the public progressed satisfactorily and the budding of navel orange on seville orange stock has also been undertaken.

The Eddie Wasp (*Eretmocerus serius*, Silv.) continues to do good work in keeping the young budded citrus plants free of the Black Fly.

Diseases and Pests—Mosaic Disease of sugar cane was prevalent in the Station at certain periods. The susceptible varieties suffered severely and had to be continually rogued.

The mango trees suffered from a severe attack of Thrips. A large quantity of the fruit was spoiled.

COW PARK NURSERY.

Approximately 10 acres of land were leased from the Caymanas Estates, Ltd., and a sugar cane nursery was set out at the Cow Park Farm. This Farm chiefly grows bananas but as a further precaution against Mosaic a clause has been inserted in the Lease that no cane shall be planted within 200 yards of the Nursery, without the Department agreeing to the variety or varieties to be planted. Water is supplied from the Rio Cobre Irrigation Works and night to ensure sufficient for requirements.

This nursery is for the quick propagation of seedling canes received from the Cane Breeding Station, Barbados. Owing to the poor and unreliable water supply at Hope and to Mosaic Disease infection, it was impossible to propagate the new seedlings there rapidly enough for extension. Sometimes a whole batch of seedlings died from Mosaic before any propagation could be made.

A large number of new seedling canes are now at the Cow Park Nursery in various stages of propagation. Here they will be sent to Experimental Plots on estates for trial.

M. S. GOODMAN,
Superintendent.

(iii) Report of the Superintendent of Sugar Cane Experiments.

Weather—Although the rainfall for the period under review was above the average the period from January to August (with the exception of March) was very dry. The drought was so severe in some districts that the cane made no growth and when the heavy rains started at the end of October, they failed to respond as they should have done. The hurricane in November also did a great deal of damage to canes throughout the Island.

Production—The output of sugar for 1939 was 117,879 tons. This figure does not include the amount of sugar made by some of the small cane farmers which is approximately 8,000 tons. It is estimated that owing to the drought in 1939, the 1940 crop will be about 112,340 tons of sugar.

Varieties—During the period under review small quantities of several of the new seedling canes have been planted out in varietal experiments on estates throughout the Island, comparison being made with the standard variety P.O.J. 2878 and B.H. 10/12.

The varieties M.P.R. 28 and F.C. 916 have been reaped on many estates. M.P.R. 28 has not come up to expectations as regards tonnage, but gives a good juice early in the reaping season. F.C. 916 is a much heavier tonnage cane but ripens later than the M.P.R. 28. The F.C. 916 is not so liable to rotting as M.P.R. 28 if it is planted under adverse conditions. The ratooning of F.C. 916 is good, and this cane should be tried out more extensively where B.H. 10/12 is badly infected in the ratoons with Mosaic. M.P.R. 28 has, so far, not shown much promise as a good ratooner.

B.H. 10/12 is still the predominant variety and has not decreased in area on estates. The greater part of the cane areas planted is in this cane, but unfortunately, there was more Mosaic in this variety in some of the cane areas that previously were almost clean of Mosaic. This is to be regretted as it will certainly affect the ratooning. It still remains the best cane for long ratooning in rich alluvial soils. It is undoubtedly a good all-round cane in field and factory.

P.O.J. 2878. The area in this cane has been maintained where Mosaic is prevalent but, owing to its juice sometimes giving trouble in the factory, it is not being increased on estates if another cane of good quality and resistant to Mosaic can be found to take its place. It gives a good tonnage as plant and first ratoons but is not very suitable for long ratooning.

P.O.J. 2727. This cane is planted fairly extensively in areas which are considered poor by planters. It passes all other varieties in the dry areas and in shotty soils. The plant cane yield for these areas is generally good but the decrease in yield is rapid in the ratoon and it is not suitable for long ratooning.

B. 3439 looks very promising wherever it has been planted. It appears adaptable to a variety of soils and gives promise of being able to stand up to adverse conditions. In the varietal Experimental Plots reaped, this cane has given better results than the standard cane B.H. 10/12. It may replace B.H. 10/12 in the areas where this cane is now grown but proves unsuitable to the existing conditions.

B. 2935 and B. 3013 have not given very good returns when compared with B.H. 10/12. This may be due to the bad weather conditions which prevailed during their growing period.

3124 is very susceptible to Mosaic. Its yields in the experimental plots were also not encouraging. It is to be regretted that the third largest planting was in mixed varieties. The disadvantage of growing more varieties in the same field has repeatedly been pointed out but the bad practice continues. When growing cane nurseries it is advisable to make allowance for an acre or more of each variety than is required so that there will be sufficient cane left in the nursery for supplying fields. This will obviate the necessity of supplying other varieties.

Yields.—The yields of cane per acre, both in plants and ratoons, have not been as good as in 1938 owing to the fact that the juice was exceptionally high in sucrose as compared with previous years. There were exceptionally high yields in individual fields in the irrigated areas.

The frequent use of artificial fertilizers on canes is marked, and planters are advised to carry out some simple experimental trials of their own.

Canes Farming.—The area of the small cane farmers is increasing yearly chiefly owing to the fact that as the cane farmers' fields go out of banana cultivation they are replanted with cane. Planters are taking keen interest in their cultivation and the result of better methods of culture can be seen in sugar manufacture in the past years.

Experiments.—Manurial and varietal experiments are in progress on several estates throughout the Island.

Factories.—The Vale Royal Factory was destroyed by fire during 1939, and is being rebuilt. Good results are obtained at the New Frome Factory.

Diseases and Pests.—There has been an increase in Mosaic Disease on a number of estates owing to the fact that the same precaution is not taken to keep this disease under control.

The moth borer was very evident in fields of some of the new varieties.

M. S. GOODMAN,
Superintendent, Sugar Cane Experiments.

(iv) *Report of the Headmaster of the Jamaica School of Agriculture.*

Change of Name.—During 1939 the name of the School was changed from Government Farm School to Jamaica School of Agriculture.

Enrolment.—School opened for the Easter Term in January, 1939, with 58 students, but one had to leave and 57 remained enrolled to the end of the school year. Christmas Term 1939, the start of the school year, opened with a enrolment of 60 students, but two failed to maintain their position. The remaining 58 students comprise 17 First Year, 20 Second Year and 21 First Year boys.

Great interest in the course offered is manifest throughout the Island, and the applicants for enrolment for the school year far exceed the capacity to accommodate them. Employment of graduates of the School stands higher than in the past.

Graduation.—Annual graduation was held on 6th July, 1939, and seventeen Third Year students received their diplomas from His Excellency the Governor. The graduates were:—

A. Gordon Archer, St. Andrew.
Lancelot Tennyson Binns, Kingston.
Samuel M. Baugh, St. James.
Egerton Fitz-Hugh Bullock, Kingston.
Carlton C. S. Bush, Kingston.
A. Barthel-Campbell, St. James.
Eric St. Anthony Cruise, Kingston.
N. McLeod Davis, Westmoreland.
Hurdon Joscelyn Duval, St. Andrew.
C. D. Frankson, St. Catherine.
John T. McKinley Girvan, Kingston.
Ronald Lloyd Linton, Westmoreland.
Stanley Ewart McCalla, St. Andrew.
St. Arthur Carl Lewis Reid, Kingston.
John Joscelyn Searchwell, Portland.
Astley Eric Thompson, Westmoreland.
C. Noel Wright, St. Ann.

The Barnes Cup was won by J. J. Searchwell.

Scholarships.—Three graduates of the 1939 class were scholars. Of the present enrolment, 14 boys held scholarships, 8 being Department of Education scholars, two Department of Agriculture scholars, three Merrick scholars, and one the first holder of the A. C. Barnes scholarship awarded by A. C. Barnes, Esq., C.M.G., the former Director of Agriculture.

Health of Students.—The health of the students has on the whole been good. Anti-typhoid inoculations were given by the staff and students during January, 1940.

Scholastic Work.—The various studies specified in the curriculum were followed with the addition of two classical subjects, Entomology and Civics, and one practical subject, Erosion Control. Emphasis continues to be placed on practical work done by the students, and the reorganizing of the school garden has been carried out to enhance the practical value of the work done there. Cyclostyled notes written by the staff, are now available for the students as an aid to their work and as permanent texts.

The Third Year students have spent half of each term at Grove Place. Numerous trips were made by Third Year students to estates, factories and other points of agricultural interest throughout the Island, and the kind cooperation shown by the proprietors and managers of these places is greatly appreciated.

Non-Scholastic Activities.—The School was very successful in sports during the period under review, winning the Sports Trophy at the Jamaica Amateur Athletic Association Sports in May, 1939, and the Cup for Second Division in the Football League. Successful sports days were held on 28th March, 1939, and 27th March, 1940. Cricket matches have been a feature of the School's sporting activity.

The Rover Crew at the School and the Jamaica School of Agriculture branch of the Student Christian Movement have been active.

Extension Work.—A successful Summer Course was held from 24th to 29th July, 1939. The Sugar Technologists' meeting was held at the School on 2nd December, 1939, and a course of entomological lectures for Officers of the Jamaica Agricultural Society on 28th and 29th December, 1939.

Numerous individuals and parties of visitors have been to the School during the year.

Advisory Board.—One meeting of the Jamaica School of Agriculture Advisory Board was held during the year.

Staff.—The Senior Assistant Master, Mr. J. M. McEwen, D.I.C.T.A., left to take up an appointment with the Permanent Lands Department at the end of the Easter Term 1939. Mr. D. J. McKinlay, B.Sc., was appointed in his place.

Mr. McKinlay was called up for duty with his Unit of the Jamaica Local Forces on August 24th 1939, and was in Active Service until 6th November, 1939, when he was ordered to return and assume his duties with the School.

I was called up for Military Service with my Unit of the Local Forces on 24th August, 1939, and was on Service until 15th September, 1939, when I was ordered to return to my duties with the Department.

I was appointed Live Stock Officer with the Food Production Board as from 16th September, and undertook duties of that office as well as my duties as Headmaster and Farm Superintendent. In order to carry out such duties it was necessary for Mr. McKinlay to undertake additional responsibilities in connection with the School and the Department.

I take this opportunity of expressing my appreciation of the assistance and co-operation rendered by the members of the Staff of the School as well as by the various Divisions of the Department.

J. W. HOWE,
Headmaster

(v) *Annual Report of the Farm Superintendent.*

Weather.—The rainfall for 1939 was 72.19 inches, of which generous precipitation 30.58 inches fell in November. Rainfall from 1st January to 31st March, 1940, totalled 3.43 inches. The early months of 1939 were dry and a seasonal drought was experienced again in early 1940.

Live Stock.—The total head of livestock at 31st March, 1940, was 477, a decrease of 122 from 1938. This includes 438 dairy cattle and young stock, 12 working steers, and 27 horses and mules. Poultry numbered 78, exclusive of baby chicks. The total valuation of all livestock was £6,363 0s. 0d.

Calvings totalled 278 for the period under review, 150 bull and 129 heifer calves being born, two of the latter as twins.

Two Jersey bulls were imported from the United States and one Guernsey bull from Canada. These are excellent animals and have been successfully acclimatized.

The health of the stock has been, on the whole, good. Details of sickness and deaths will be found in the reports of the Senior Veterinary Officer.

Large sales of livestock have been a feature of the period under review, and reflect not only the policy of the Department but also the demand for female stock for sale but the greatly increased interest in good cattle of dairy breeding manifest throughout the Island. Ten bulls were sold, eight to the Live Stock Division for service in country stud stations, and two to private herds. Bull calves sold totalled 74, as against 43 last year, and heifer calves sold totalled 38. These young animals are sold by bookings, and there are at present long waiting lists. One cow was sold for milking. Two sales of young and older heifers were held, and 78 head sold. These heifers seem to have been greatly appreciated by purchasers and have helped stimulate interest in good dairy stock. Sales to butcher totalled 87 head of old, and otherwise unsatisfactory animals.

The poultry flock was maintained in good condition and production. One White Leghorn pullet produced 12 eggs in 12 months, the best record for the period. Sales included 15 head mature stock, 82 baby chicks and a dozen hatching eggs.

The public stud station was patronized by 56 cows during 1939, and 15 cows since the 1st January 1940. The stud station will come under the Live Stock Division in future.

Dairy Produce.—Milk production for 1939 totalled 324,226 quarts, 17,885 quarts more than 1938, and from 1st January 1940, 66,424 quarts have been produced. The 1939 figure represents an average daily production of 888.3 quarts, 49 quarts per day more than the year before. The average daily output for the first three months of 1940, namely, 729.9 quarts, shows the depressing effect of dry weather on the milk flow.

Sales of milk for 1939 totalled 278,054 quarts, or 18,293 quarts more than 1938, while 61,890 quarts were sold between 1st January and 31st March, 1940. The great bulk of this milk goes to public institutions in the Corporation Area, requisitions from which continue to increase. The sales for 1939 represent an average of over 190 gallons of milk a day, yet during dry months the farm is unable to fully satisfy the demand. Butter was made from the surplus quantity of surplus milk available during the grass months.

The average daily production per cow in 1939 showed a slight decrease over the previous year, the figure being 4.94 quarts per day, but the average annual production per cow of 4,361 lbs. in 330 days, showed an increase over the slightly longer average lactation of the 171 cows which completed lactations within the year. A daily average of 180 cows were milked, 16 more than in 1938.

The grade Holstein cow "Martha" again headed the list of milking cows with a production 9,181.9 lbs. of milk in 365 days. Of the various breeds represented in the herd, the Holsteins averaged the highest production 5,631.0 lbs. of milk in 332 days, followed by the Jerseys with 4,161.0 lbs. in 315 days. The Grade Montgomerie were not seriously affected by the severe droughts early in 1939, and averaged 4,083.0 lbs. of milk in 294 days, while the Guernseys, sensitive to extremes of weather, and including many first calvers, averaged 4,079.3 lbs. in 294 days in milk.

Feeds and Crops.—Grazing conditions have been variable, periods of both excellent pasture conditions and of shortage of grass being experienced. Valuable as they are during good weather, guinea grass and seymour grass leave much to be desired during droughts, and the feeding of harvested roughage is an annual necessity. Unfed chaffed, and guinea corn, fed as chaff or silage, have been valuable standbys, and the acreage under these crops has increased. Good results have attended the use of guinea corn as stack silage, seymour grass hay and guinea grass pods. Guinea grass from the non-pastured hills was cut and fed and some grass was purchased.

Increasing quantities of locally produced coconut meal and either crushed or whole corn have been used in the feed, it was necessary, nevertheless, to supplement these with imported feeds, which included bran, oats, linseed and cotton seed meal, bone meal, rock salt, etc., together with dried milk products for calves. The proportion of locally produced feeds used on the Farm is increasing, and our dependence on imported concentrates being gradually reduced.

The Bombay Mango crop for 1939 was the best in the history of the Farm, over 12,000 dozen mangoes were reaped. The bulk of the crop was handled by the Marketing Department.

Reafforestation and Erosion Control.—The areas on the Liguanea Ridge previously planted out in forest have been maintained and no new planting was undertaken. Control of gullies in the pastures on this ridge has been started, and further work in this direction is planned.

Buildings and Equipment.—Besides the maintenance of existing buildings, a new milk room was built and a range of poultry runs moved to a new site and extended. Work was started on the enlarging of the smaller of the two dairy buildings from 60 cow to 100 cow capacity.

A diesel engine tractor was purchased to assist working the growing crop acreage, and some items of old equipment were sold.

Extension Work.—Numerous parties of school children and of members of the Jamaica Agricultural Society visited the Farm, besides many individual visitors, a considerable number of whom were from abroad.

Dairymen and penkeepers continue to consult the Farm on their livestock and dairy problems either by personal visits or by letter. Registration of purebred cattle in the Jamaica Herdbook has been continued. The large number of pedigree certificates for cattle bred on the Farm issued during the last fifteen months reflect the increasing interest taken in dairy cattle throughout the Island.

J. W. HOWE,
Farm Superintendent.

(vi) *Report of Superintendent, Grove Place Stud Farm and Experiment Station.*

Weather.—There was an improvement on the rainfall of the previous year, there being a deposit of 79.10 inches compared with 71.51 inches in 1938. This, however, was offset by the hurricane which struck the entire Island in November and did much damage to bananas and other food crops.

Experiment Station.—In addition to established Sections, fertilizer experiments in connection with maize, red round-nuts and sweet potatoes were conducted. Extension of areas under fodder crops was continued. The majority of the grapefruit trees at the Manurial Experiment Plot came into bearing during the year. These gathered and records made for analysis. Maturity tests were conducted twice during the season by the Agricultural Chemist. The survey for the control of Fiddler Beetle and Slugs was continued.

Restock.—The practice of breeding race-horses and mules was discontinued so as to make available suitable stock for the extension of experiments with field crops.

The experiments in connection with concentrated feeds to dairy cattle were completed after two years and information obtained.

There was very great demand for the limited number of dairy cows and heifers available for sale.

All animals maintained good health, and Stud Services received increased patronage. A fair number of pure-breds were distributed and new blood was introduced by the importation of three pure bred Berkshire boars and notes from Canada.

The Tables below show the Livestock at Grove Place, in December, 1938, with their valuation, also Records of Services, Sales, Births and Deaths, during the period January 1st, 1939, to March 31st, 1940.

TABLE I.

LIVESTOCK AND VALUATION, DECEMBER, 1939.

	Cattle					Other Stock			
	Bulls and B.Cs	Cows	Heifers	C. C. 1939	Steers	Horse-kind	Pigs	Bees	Total.
.. ..	7	39	43	25	5	22	16	20	
.. ..	£69 10	£477	£283	£74 10	£51 10	£327 13	£146 17	£20	£1,450

TABLE II.

Services, January 1st, 1939 to March 31st, 1940.

	Mares to Stallion	Mares to Jack	Jennets to Jack	Cows	Sows
.. ..	1	1	4	123	8
.. ..	50	38	12	89	36
Totals	51	39	16	212	44

TABLE III.

Births, January 1st, 1939 to March 31st, 1940.

	Foals				Calves		Pigs	
	Colts	Fillies	Mule Cubs	Donkey Cubs	B.C.	C.C.	Boars	Shotes
.. ..	2	Nil	Nil	2	28	28	34	33

TABLE IV.

Sales, January 1st, 1939 to March 31st, 1940.

	Fillies	Colts	Mules	Sows	Boars	Shotes	Bull	Draft Cattle	B.C.	Total
9	2	2	2	7	* 20	* 19	1	63	26	
10	£26	£25	£32	£16	£18 10	£17 10	£35	£459 16 3	£12	£819 6 3

*N.B. Value of 10 Half-bred boars and 7 shotes included in sale of sows.

TABLE V.

Obituary List, January 1st, 1939 to March 31st, 1940.

	Heifers	B.C.	Sow	Pigs	Mares	Jennet	Bull
.. ..	4	2	1	*28	3 Destroyed	1 Destroyed	1

* N.B. Several crushed at birth.

Agricultural Education.—The Senior Students of the Jamaica School of Agriculture attended for the usual in Practical Agriculture—the course extending over three periods of five weeks respectively.

Several Demonstration Days for Agriculturists were observed, and nine lectures delivered at Agricultural meetings.

Equipment.—Sanitary improvements were effected by the installation of Sewerage System at the quarters of the Superintendent of Stock and the Students.

There is need for the improvement of the present Lighting System.

L. A. POWELL,
Agricultural Superintendent.

(vii) *Report of Senior Veterinary Officer.*

1. **General Field Work.**—Between April and October surveys were made for the establishment of twenty agricultural Livestock Improvement Centres. Tours and meetings were conducted to stimulate dairying in view of the increased demand for milk for public needs, and the operation of the Milk Condensary at Bybrook, St. Catherine in March, 1940. These activities were transferred in November to the Livestock Branch of the Food Production Board.

2. **Disease Control.**—Education in this matter was maintained by meetings with livestock owners and the auspices of the Jamaica Agricultural Society.

Notifiable Diseases.—No outbreaks of Glanders, Anthrax, Foot and Mouth disease or other disease under Law were established, except of Swine Fever, which occurred as follows:—

(i) In Kingston and St. Andrew Corporate Area in December, 1939, and February-March, and subsequent 1940 among garbage-fed hogs.

(ii) In a large area of Trelawny for six months ending 31st March, 1940.

(iii) At Spring Pen, St. Thomas, Kildare in Portland, Bengal in St. Ann in February, 1940.

3. **Non-Notifiable Diseases.**—Diseases dealt with were psoroptic mange of mane stock, ulcerative lymphangitis, tetanus, tuberculosis of cattle, contagious bovine abortion, tick fever of cattle (piroplasmosis and anaplasmosis), blackleg, haematuria vesicalis of cattle, parasitic gastro-enteritis of calves and goats, liver fluke of cattle and and necrobacillosis of goats in particular.

4. **Miscellaneous.**—Reports of *Urechites suberecta* poisoning of cattle, worm infestation of swine, and mineral poisoning of livestock received attention.

GOVERNMENT STOCK FARM, HOPE.

1. **Tuberculosis.**—The regular Annual Tuberculin Test was made August 14-19, 1939, on all the cattle (included) on the Farm—507 head.

Result: One calf reacted positively, but showed no gross lesions at autopsy.

2. **Infectious Bovine Abortion.**—

(i) Conditions at the Farm are much the same as in past years.

(ii) The Parturition and Abortion Record for the last 15 months is:—

270 full time births including one twin birth

8 still births at full time.

8 abortions (premature births).

(iii) Sterility of cattle of breeding age necessitated the drafting and sale for slaughter of 21 cows and heifers during the last 15 months and interferes seriously with the breeding programme of the Farm.

3. **Actinomyces.**—This infection increased perceptibly in the last 15 months, nine cases being recorded, six cases showed dental involvement.

4. **Miscellaneous Ailments:**—Retention of foetal membranes (7 cases) prolapsed uterus (4), parturient palsy (1), fractured limbs (2), garget (4), mango colic (6) and severe indigestion (8).

GROVE PLACE STUD FARM.

1. The general health of the animals has been good. Drought from late November, 1939, to end of March 1940, caused a shortage of good grazing.

2. The cattle were vaccinated against anthrax and blackleg as usual. No cases of these diseases occurred on the Farm.

3. All the cattle on the Farm on August 8th, 1939, namely, 112 farm-owned and 45 sent to the stud bulls, were tuberculin tested with negative results.

4. Psoroptic mange among the farm-owned mane stock and mares to the stud has been kept under control.

VETERINARY EDUCATION.

Scheduled Lectures and Demonstrations in Veterinary Science were given at the Jamaica School of Agriculture.

2. The Senior Veterinary Officer gave twenty-three Lectures on Meat Inspection and Hygiene (February to April 24th, 1939) in the school for Sanitary Inspectors conducted under the auspices of the Royal Sanitary Institute.

STATISTICS OF 1939.

1. See Annual Report, 1938, for information regarding Livestock and Grazing Area, Slaughter Houses, Milk and Butter.

2. **Domestic Meat Supply.**

	1937.	1938.	1939.
Cattle Slaughtered for Beef:	36,719	35,326	33,900
Value at £6 10s. (estimated)	£238,673	£229,619	£220,350

No returns are available of sheep, goats or swine slaughtered.

3. **Hides and Skins (exported): Exports and Imports of Livestock (1939).** See Trade Report 1939.

STATISTICS OF 1939, *contd.*

4. Registered Dipping Tanks for Tick Control:—

1937.	1938.	1939.
384	387	393

(ii) Sales of Paranaph and Arsenite of Soda chiefly for charging dipping tanks:

	1937.	1938.	1939.
Paranaph ..	38,976 lbs.	33,859 lbs.	36,588 lbs.
Arsenite of Soda ..	21,650 "	19,450 "	20,150 "

Many tanks are charged with Cooper's Cattle Dip in lieu of the Department's formula.

5. The Animal Quarantine Station at Plumb Point on Palisadoes of Kingston Harbour was completed by the Public Works Department on 13th October, 1939.

S. LOCKETT,
Senior Veterinary Officer.
2.9.40.

(viii) Report of Conservator of Forests.

1. FOREST AREA.

Forest Area.—The area of Forest Reserve was increased to 200,999 acres: areas of other Crown Land and other Forest remained unchanged.

2. FOREST RESERVATION AND DEMARCATION.

Reservation.—A further area of 3,363 acres of land was gazetted as Forest Reserve (Jamaica Gazette dated November 7th, 1939).

Land Settlement.—It has been accepted in principle that all lands reserved for forest on land settlements are to be administered by the Forestry Division.

Water Commission Lands.—Progress is being made in the survey and demarcation of Water Commission Lands and the Forestry Division has assumed control of these lands.

War Department Lands.—The lease of the remaining War Department lands in the Hope catchment, has been terminated and ejected tenants have been settled on Middleton property.

Demarcation of Boundaries.—The demarcation of a total of 90 miles of boundary was completed.

3. ACQUISITION OF LAND.

Forestry Division Funds.—Five properties totalling 1,252 acres were purchased for Forest Reserve in the Blue Mountains.

Water Commission Funds.—Acquisition of small parcels of land in the Hermitage catchment was continued by the Water Commission, in addition to the purchase of a larger property of 800 acres. The property "Middleton"

in the Hope catchment was purchased jointly by the Lands Department, Water Commission and Forestry Division. The reserved area amounted to approximately 709 acres.

4. SURVEYS.

Surveys.—During the period 33.85 miles of survey were completed for the Division by the Surveyor General at a cost of £670.

5. MAINTENANCE OF FOREST RESERVES.

Bridle Roads.—At the end of 1938, the Division maintained 44 miles + 63 chains of bridle road: 2 miles + 43 chains of new road was constructed, the length maintained at March 31st, 1940, thus amounting to 47 miles + 26 chains.

Buildings.—Six Rangers' quarters and 5 patrol huts were maintained.

Forest Offences.—Forest offences totalled 121, of which 27 were for larceny of timber, 78 for encroachment and 16 for cattle trespass.

Fires.—Twelve fires were reported during the period and 50 acres were estimated as having been burnt. Damage to economic growing stock was negligible, but protective soil cover was damaged.

6. AFFORESTATION.

Afforestation.—Afforestation of denuded areas continued in the Kingston Water Supply catchments and in the Blue Mountains. Centres were maintained at Hermitage, Rose Hill (Hope River), Shooters Hill (Ginger River) and Greenhills (Buff Bay River). Weather conditions were extremely unfavourable and considerable mortality was experienced in the young plantations, owing to drought in the first half of 1939 and storms in November. The weather did some damage to older plantations as well as to young plantings. Only 45,000 plants were put out on the Blue Mountains during the year: allowing for variations in planting distances, it is estimated that 65 acres were planted. The principal species employed were Cedar (*Cedrela odorata*), Mahoe (*Hibiscus tiliaceus*), Mahogany (*Swietenia mahagoni* and *S. mahagoni*), Hong Kong Pine (*Pinus massoniana*), Yacca (*Podocarpus longatus*), Juniper cedar (*Juniperus lucayana*), Wild Tamarind (*Pithecolobium arboreum*). Thirteen nurseries were maintained in the Blue Mountains and 1,358 quarts of seed were collected: in collaboration with the Jamaica Agricultural Society, four of these nurseries are designed for raising plants for distribution to private persons.

Small areas on the Liguanea Ridge and Palmetto Grove were afforested: on the Liguanea Ridge, *Glicicidia* cuttings are showing promise, while at Palmetto Grove Teak (*Tectona grandis*) and Cedar (*Cedrela odorata*) have been planted.

The following summary indicates the approximate area of plantations maintained: all work is intensive and the regeneration of land not hitherto under Forest of value:

Area of plantations on January 1st, 1939 ..	342 acres
Added during period	70 "

Total at March 31st, 1940 .. 412 "

7. UTILISATION.

Crown Lands Forest Produce Rules.—These rules were thoroughly revised and the classification and schedules tightened up. This has brought about a gratifying increase in royalty, coupled with less waste in utilisation.

Licences.—During the period 131 licences were issued, and the out-turn of timber and fuel from Crown Lands from January 1st, 1939 to March 31st, 1940 amounted to 59,693 cubic feet.

Included in the above are 877 cubic feet cut under free licence for the Forestry Division and Lands Department.

The sale of green standing mahogany was suspended, owing to overcutting: yield of other species is controlled by minimum felling girth limits.

Imports and Exports of Forest Products.—The exports and imports of forest products for the year ended December 31st, 1939, are given in Appendix 3.

8. RESEARCH.

Routine research in silviculture and utilisation was continued.

9. FINANCE.

The total expenditure of the Division from January 1st, 1939 to March 31st 1940, amounted to £9,417, revenue for the same period amounted to £1,284.

10. ADMINISTRATION.

Crown Lands.—Considerable modification in the organisation and duties of the field staff were approved and put into force in order to achieve better control of Crown Lands. There had been considerable overlapping responsibilities of the Forest Guards and Watchers of the Forestry Division, and the Bailiffs and Headmen of the Lands Department: the latter officers were part-time and with few exceptions were entirely unsatisfactory. Part-time employment has been abandoned and instead of Bailiffs, 8 new Rangers have been appointed in the Lands Department. Similarly the Guards and Watchers of the Forest Department will now be known as Rangers: a Ranger is in charge of an area of Crown Land and Forest Reserve and combines the duties of a Forest Guard and Bailiff. This organisation has been achieved without any extra expense and it is believed with prospects of more efficient control of Crown Lands.

Labour Force.—During the period under review, approximately £3,000 was expended on labour: average employment was 4 days a week, and average pay was 3/- per day, equivalent to a permanent labour force of 60.

11. GENERAL.

Study Courses.—The Forest Officer paid a visit to Puerto Rico and Haiti in March to study the effects of deforestation and erosion in those countries and also to study silvicultural methods on the large-scale afforestation projects being pursued in Puerto Rico.

The Forest Officer was granted a travelling award financed by the Carnegie Corporation of New York and spent two months in the United States of America, studying erosion control methods, water conservation, wildlife management, silvicultural technique, etc.

These trips have proved extremely interesting and instructive and many of the lessons learnt are being applied to the work in Jamaica.

Wild Life Protection.—The Forest Officer was appointed Chairman of the Bird Protection Committee, which submitted its report in June, 1939: the bulk of the recommendations were accepted by Government and draft legislation to give effect to the recommendations was prepared. Pending revised legislation, certain changes were made in close seasons and in the schedule of protected birds under the existing law.

Propaganda and Education.—A poster to encourage the protection of forests and trees was designed, executed by Miss Rhoda Jackson, and printed in four colours: this has been circulated to schools, land settlements, branches of the Jamaica Agricultural Society, etc. Lectures on forestry and erosion control were given at the Summer School at Hope to branches of the Jamaica Agricultural Society, at training colleges, etc., and by broadcast at local stations: while 5 articles were printed in the journal of the Jamaica Agricultural Society.

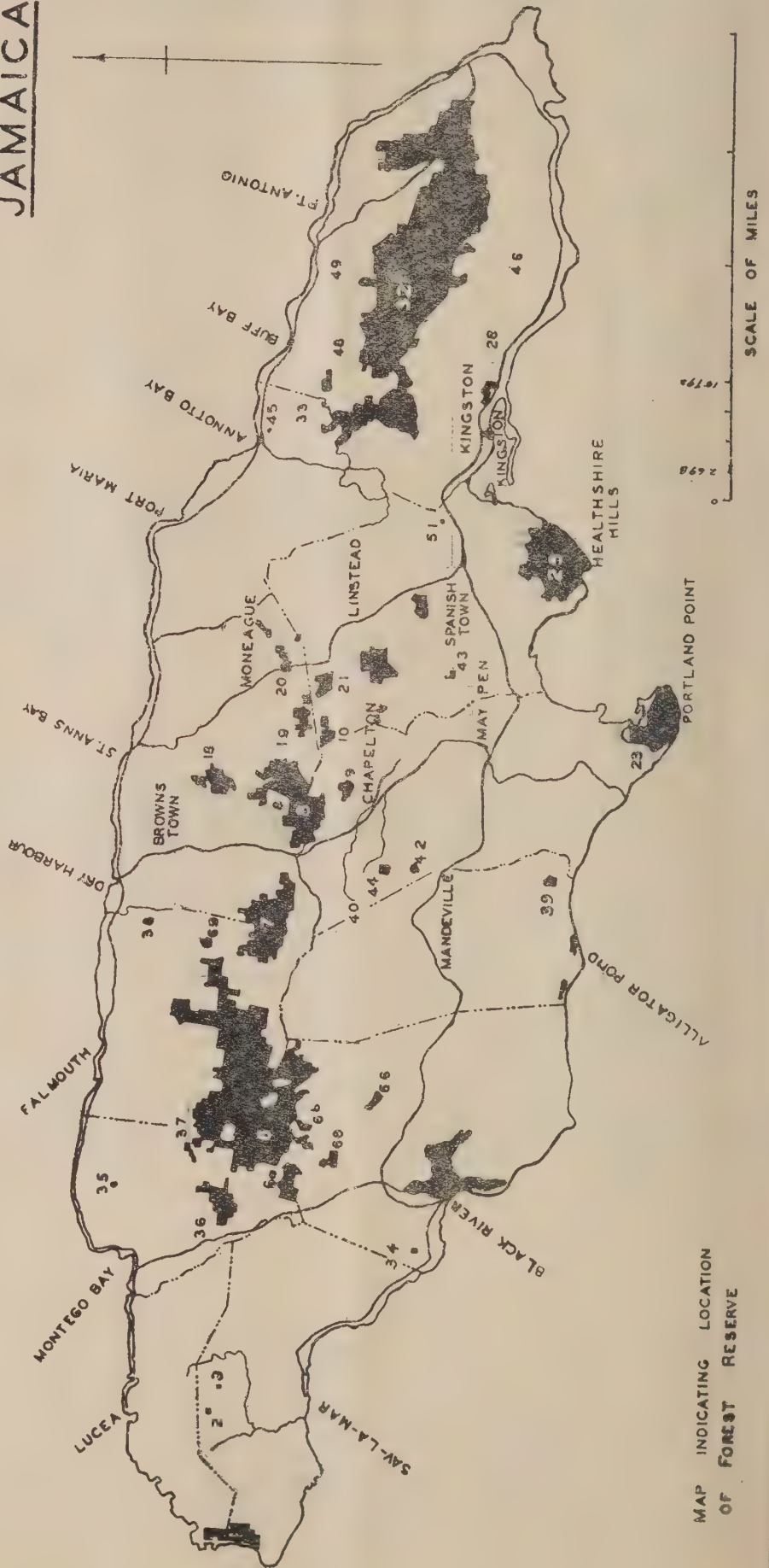
Weather.—For the second year in succession rainfall was extremely abnormal in distribution, being 12% below normal for the first six months of 1939 and 29% above normal for the second six months. The dry weather of summer was followed by torrential rains and wind in November, causing considerable damage to plantations, buildings and communications: all damage was repaired from funds provided for the purpose.

C. SWABEY,
Conservator of Forests.

PROGRESS IN FOREST RESERVATION AND DEMARCATION.

Map No.	Name of Reserve	Reserves approved but not legally constituted				Reserves constituted but not completely demarcated				Reserves constituted and demarcated				Grand Total
		on Jan. 1, 1939	Added during year	On Mar. 31, 1940	On Jan. 1, 1939	Added during year	Excluded or transferred	On Mar. 31, 1940	On Jan. 1, 1939	Added during year	Excluded during year	On Mar. 31, 1940	On Mar. 31, 1940	
2	<i>Protection Reserves:</i>													
9	Dolphin Head ..	69	..	..	300	.. 69	..	300	..	..	..	..	300	
32	Bull Head ..	2,343	..	..	700	3,204	..	769	..	..	..	..	769	
33	Blue Mountains ..	..	..	..	81,000	..	..	84,294	..	..	..	..	84,294	
	Haycock Hill ..	..	..	..	600	..	..	600	..	..	..	..	600	
	Total ..	2,412	..	..	82,600	3,363	..	85,963	..	..	..	..	85,963	
3	<i>Production Reserves:</i>													
6A	Burnt Savanna ..	..	..	..	51,000	..	..	51,000	97	..	..	97	51,000	
6B	Cockpit Country ..	..	..	..	1,300	..	..	1,300	..	..	..	..	1,300	
6C	Ruthven ..	..	..	..	1,350	..	..	1,350	..	..	..	..	1,350	
6D	Shuna ..	..	..	..	600	..	..	600	..	..	..	..	600	
6E	Discovery ..	..	..	..	12,500	..	..	12,500	..	..	..	..	12,500	
7	Dry Harbour Mts. West ..	..	..	..	14,200	..	..	14,200	..	..	..	..	14,200	
8	Dry Harbour Mts. East ..	..	..	..	1,500	..	..	1,500	..	..	..	..	1,500	
10	Kelleys ..	..	..	..	3,000	..	..	3,000	..	..	..	..	3,000	
18	Ballintoy ..	..	..	..	1,600	..	..	1,600	..	..	..	..	1,600	
19	Camperdown ..	..	..	..	720	..	..	720	150	..	..	150	720	
20	St. Faith ..	..	..	..	7,700	..	..	7,700	..	..	..	..	7,700	
21	Charlton ..	..	..	..	19,319	..	..	19,319	..	..	..	..	19,319	
23	Portland Ridge ..	..	..	..	..	..	..	..	..	..	..	..	..	
25	Healthshire Hills ..	..	..	..	..	..	..	..	..	..	..	..	..	
	Total ..	..	..	..	114,789	..	..	114,789	247	..	..	247	115,036	
	Grand Total ..	2,412	..	..	197,389	3,363	..	200,752	247	..	..	247	200,999	

JAMAICA



MAP INDICATING LOCATION
OF FOREST RESERVE

Category	Gross Imports		Gross Exports		Net Imports or Exports		Average annual net Imports or Exports for Quinquennium ending 31st Dec., 1937		Percentage value of Gross Imports or Exports from or to different sources or destinations during the year
	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	
TIMBER—									
Sawn:									
Douglas Fir ..	2,323	26,027	..	..	2,323	26,027	1,296	13,575	Canada 100%
Pitch Pine ..	10,950	131,096	..	..	10,950	131,096	11,742	121,117	U.S.A. 88%; Bahamas 11%; Santo Domingo 1%
White Pine ..	254	3,379	..	..	254	3,379	109	1,508	Canada 100%
Unenumerated ..	107	2,490	..	..	107	2,490	126	2,394	
Logs:									
Ebony ..	..	..	4	58	4	58	6	232	U.K. 88%; U.S.A. 12%
Lignum Vitae ..	..	..	157	2,093	157	2,093	119	1,329	U.K. 58%; France 24%; U.S.A. 6%; Others 12%
Satinwood ..	..	18	7	78	7	60	..	220	Cayman Islands 100%; Cayman Islands 100%
Unenumerated ..	..	2	..	..	..	2	..	..	Cayman Islands 100%
Roundwood:									
Piles:									
Greenheart ..	..	309	..	..	..	309	..	600	Br. Guiana 100%
Crooked ..	..	1,446	..	..	..	1,446	..	..	U.S.A. 70%; Trinidad 30%
Lancewood ..	..	..	..	2	..	2	..	..	Canada 100%
Others ..	..	6	..	..	..	6	..	..	Cayman Islands 100%
Total Timber	13,634	164,773	168	2,231	13,466	162,542	13,148	137,413	
Wood Products—									
Shingles:									
Cypress and Wallaba ..	..	790	..	..	..	790	..	930	U.S.A. 95%; Br. Guiana 5%
Boston Cliffs:									
Cedar and Others ..	..	3,881	..	..	..	3,881	..	3,441	Canada 91%; U.S.A. 9%
Matches ..	..	87	..	..	..	87	..	403	U.K. 36%; Sweden 63%; U.S.A. 1%
Paper and Pulp Products ..	..	144,063	..	..	..	144,063	..	103,251	U.K. 27%; Canada 17%; U.S.A. 32%; Holland 8%; Others 16%
Other Cellulose Products ..	..	172,417	..	..	..	172,417	..	121,189	U.K. 25%; U.S.A. 16%; Japan 11%; Canada 10%; Italy 8%; France 7%; Others 23%
Furniture ..	..	14,056	..	..	..	14,056	..	15,467	Canada 28%; U.S.A. 21%; Sweden 20%; Others 31%
Hoops, Shooks, Staves, etc. ..	..	78,429	..	..	..	78,429	..	69,064	Canada 42%; U.S.A. 45%; U.K. 1%; Germany 7%; Others 5%
Carried forward	..	413,723	..	..	..	413,723	..	313,745	

APPENDIX 2.

IMPORTS AND EXPORTS OF TIMBER AND FOREST PRODUCE DURING YEAR ENDED DECEMBER 31ST, 1939.

Category	Gross Imports		Gross Exports		Net Imports or Exports		Average annual net Imports or Exports for Quinquennium ending 31st Dec., 1937		Percentage value of Gross Imports or Exports from or to different sources or destinations during the year
	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	
Brought forward	..	413,723	..	..	..	413,723	..	313,745	U.K. 10%; Canada 16%; U.S.A. 35%; Others 39%
Wood Products— <i>contd.</i>	..	11,775	..	..	..	11,775	..	120,052	
Other Wooden ware	..	..	..	..	..	..	..	..	
Total Wood Products	..	425,498	..	..	..	425,498	..	325,767	
MINOR FOREST PRODUCTS—									
Tan Stuffs and Dye Stuffs:									
Logwood Extracts	..	..	..	78,155	..	78,155	..	73,401	U.K. 93%; Eire 2%; Others 5%
Logwood	..	..	..	16,598	..	16,598	..	31,515	U.K. 1%; U.S.A. 57%; France 34%; Germany 8%
Fustic	..	..	..	2,592	..	2,592	..	3,030	U.K. 24%; U.S.A. 41%; France 35%
Divi-divi	..	..	..	902	..	902	..	860	U.K. 89%; Br. Honduras 2%; Belgium 9%
Mangrove Bark	..	66	..	..	..	66	..	..	Cayman Islands 100%
Drugs, Spices:									
Cactus	..	..	..	97	..	97	..	..	U.K. 14%; U.S.A. 76%; Poland 10%
Sarsaparilla	..	..	..	2,688	..	2,688	..	..	U.K. 78%; France 10%; Others 12%
Barks	..	..	..	247	..	247	..	..	U.K. 10%; U.S.A. 71%; France 9%; Germany 7%; Others 3%
Bitterwood	..	..	..	888	..	888	..	..	U.K. 32%; U.S.A. 26%; France 32%; Others 10%
Quassia Chips	..	..	..	2,642	..	2,642	..	6,380	U.K. 16%; U.S.A. 51%; Germany 27%; Canada 2%; Australia 2%; Others 2%
Incense and Perfume woods:									
Amirisa Wood	..	..	..	193	..	193	..	295	U.K. 9%; U.S.A. 8%; Germany 39%; Holland 44%
Sandalwood	..	..	..	131	..	131	..	..	U.K. 100%
Miscellaneous:									
Cork	..	3,752	..	3,752	..	..	..	3,193	Spain 55%; U.K. 10%; Portugal 23%; U.S.A. 9%; Others 3%
Total Minor Forest Products	..	3,818	..	105,133	..	101,315	..	118,674	

(ix) Report of Supervising Inspector of Plant Diseases.

Supervision of Inspectors' districts was maintained throughout the year. The Inspectors of Plant Diseases gave up all Spraying Demonstration plots to the Leaf Spot Control Board at the beginning of the year. The work of Panama Disease was rigidly carried out throughout the year. Many areas were thrown up to growing to the epidemic state of Panama and Leaf Spot Diseases.

CITRUS.

The citrus nurseries at Charlton and Tamarinds were supervised. In September the Agricultural Officer went on months' leave and I carried out the distribution of 26,000 budded plants. There were 6,000 distributed from the Prison Nursery and 20,000 from the Charlton Nursery. There are now ready for distribution at the Prison 18,000 plants and at the Charlton Nursery 32,000.

The following is a list of plants other than citrus distributed from the Charlton Nursery from 1937 to date:—

Banana Suckers	40,240
Guatemala Grass	57,012
Potato Slips	55,725
Annatto Plants	32,800
Canes	57,900
Pears	257
Cassava Sticks	47,450
Cocoa	5,805
Coconut Plants	1,588
Coffee Plants	5,950
Total	304,727

At least hundred quarts of Bitter Orange seeds have been sown in the nursery beds at Hope.

MANGO BUDDING.

The position of this campaign on the Liguanea Plains is as follows:—

No. of Trees budded	6,033
No. of Buds	22,135

J. B. SUTHERLAND,
Supervising Inspector of Plant Diseases.

(x) Report of the Acting Agricultural Superintendent.

Citrus Extension.—Further progress has been made in the Citrus Development Scheme and during the period under review the following plants were distributed:—

Grapefruits	2,082
Oranges	22,538
Varieties	22
Total	24,642

This makes a total of 120,364 plants distributed since the scheme began. Many of the plants sent out at the beginning of the undertaking are now coming into bearing. Growers are being encouraged to apply artificial manures in view to forcing the plants for early production.

The nurseries at the Prison Farm (Tamarinds) Spanish Town, and at Charlton, Ewarton, have been maintained under the supervision of the Supervising Inspector of Plant Diseases.

Demonstration Plots have been maintained at Islington, Highgate (St. Mary) and at Llandewey (St. Thomas) as the Manurial Plot at Wakefield.

L. L. CARRINGTON,
Acting Agricultural Superintendent.

(xi) Report of the Crop Development Officer.

The Crop Development Section was formed in March, 1939, to study minor fruit crops, notably avocado pears, limes and limes with particular reference to the development of varieties suitable for export.

Avocadoes.—Storage tests on the fruit of imported avocado varieties have given promising results in several instances. Experiments on the grafting and budding of avocadoes have been started, and over 1,100 budded trees are growing and will be distributed in variety trial plots.

Mangoes.—Storage tests on the mango variety Haden suggest that it will ship more satisfactorily than the variety (Pairi) or Julie mangoes. A technique was evolved for propagating mangoes by shield budding that gave satisfactory results during summer months, but not during the winter. A large nursery of seedlings has been raised and is to be budded during the coming summer.

Limes.—In view of the high proportion of West Indian Limes handled by the Marketing Division that were exported, an attempt was made to encourage growers to pay more attention to the cultivation and pruning and the handling of the fruits. In most cases these efforts were unsuccessful, and attention has therefore been turned principally to the development of the large fruited, seedless Tahiti lime. A number of lime trees on the properties were top-worked with this variety, and budding has been started in a nursery established at the Prison. A technique has been evolved which it is thought will minimize the risk of die-back in budding West Indian limes with the Tahiti.

G. K. ARGLES,
Crop Development Officer.

(xii) *Report of Chief Inspector of Produce.*

1. *The Produce Law.*—During the period under review Regulations dealing with Citrus and Bananas approved and passed by the Governor in Privy Council. In respect of Citrus, it was required that all exports should be registered and that shipments of fruit being made to Bermuda and England should be quoted at Produce Board. In respect of Bananas, the sale or purchase of thin and immature fruit was prohibited has had a remarkable effect on our trade, sending up the weight per count bunch by over 25% and the capacity per count bunch by the same figure. It has also reduced to a negligible quantity rejections by the Companies of bananas which are thin and immature. Losses to growers on this account were previously estimated to be in the vicinity of £100,000 annually.

2. *Revenue from Licences.*—There has been a slight increase in this respect of about £400, the figure £3,811 as compared with £3,388 in 1939. This is attributed to the taking out of produce licenses by a large number of persons who were trading in the fall of 1939.

3. *Court Cases.*—There has been a marked reduction in Court cases under the Produce Law in which the Inspectors have appeared. In 1938 there were 57 as compared with 15 in the period under review. This is the more careful observation on the part of the public of the requirements of the Produce Law and its regulations.

4. *Retention and Destruction of Produce by Inspectors.*—In this respect it should be pointed out that the amount of produce destroyed in no way indicates the value of the Inspectors' work. This is to be seen in the quality of produce leaving the Island under his constant supervision at all points throughout the Island.

A total of 62,706 stems of bananas were rejected as unfit for export during the period under review as compared with 62,182 in 1938, and 12,896 boxes of citrus were detained for reconditioning and subsequently allowed to be shipped as compared with 12,240 for 1938. Of pimento, cocoa and coffee and other minor products, our detentions and destructions were small and unimportant as compared with the quantities exported.

5. *Observations on the Crops generally for the Year.*—Due to drought, the spread of leaf spot disease and heavy rejections of bananas on the score of being poor were heavy during the year. Another factor which is becoming more and more important is that of cultivation; small growers are neglecting their banana cultivations in various sections of the Island. The volume of our citrus export has not been as great as that of 1938-39, which was 500,000 boxes; it is expected to be about 70,000 boxes less. This is to be attributed to drought and hurricanes, also unfavourable markets in certain months of the year.

Equipment and buildings in packing houses have been improved during the period under review and compares favourably with that of any country.

6. *Minor Crops.*—

Cocoa.—Demand has been steady and the quality has been fair. Equipment for drying has been improved and extended in some parishes.

Coffee.—This crop still remains a problem. Improvement has taken place in the direction of central depots, six of which are now in operation.

Pimento.—Volume is recovering and prices have been remarkably high, reaching 70/- per cwt.

Honey.—The honey crop has been good. Prices of this commodity have also been high, exceeding in some cases 8/- per gallon.

Tomatoes.—The export of tomatoes has increased; a high quality has been maintained and extension of the crop is anticipated. Nearly 30,000 lugs were exported during the period under review.

7. *Produce Board.*—The Produce Board met when necessary and the personnel has remained the same.

8. *Staff.*—I regret to record the death of Mr. Ian H. Campbell one of our Inspectors. Mr. L. H. Bicknell has been appointed to fill the vacancy resulting therefrom.

P. W. MURRAY,

Chief Inspector of Produce

C. RESEARCH AND LABORATORIES.

(xiii) *Report of the Government Chemist.*

In this report the figures given under 1939, are for the calendar year, and the figures under 1939-40, are for the fifteen months period.

The number of specimens analysed and the investigations carried out during these periods are shown in the following table.

"A" OFFICIAL.		1939	1939-40.
Police—			
Toxicological, and human viscera	..	312	570
Murder and shooting	..	122	143
Arson	..	39	39
Housebreaking and larceny	..	42	43
Coinage	..	1,478	1,802
Dangerous drugs	..	1,160	1,410
Medical Law	..	110	457
Spirit and Rum Laws	..	95	146
Other Laws	..	69	84
Total Police	..	3,427	4,694
Customs—			
Department of Science and Agriculture	..	388	457
Island Medical Office	..	66	66
Department of Public Works	..	44	64
Other Government Departments	..	59	59
Kingston and St. Andrew Corporation	..	7	7
	..	1	4
Total Official	..	3,985	5,351

"B" UNOFFICIAL.

			1939	1939-40.
Government Stock Farm	..	..	1,165	1,443
Rums	..	..	181	210
Cattle Dips	..	..	80	99
Miscellaneous	..	..	148	204
Total Unofficial			1,574	1,956
Grand Total			5,559	7,307

305 specimens of human viscera were submitted in connection with 190 deaths. In 87 cases poison was found. Following tables show how these specimens were distributed through the period, and the nature of the poisons found.

Period:		Number of deaths.	Positive cases.
Jan.-March 1939	..	32	17
Month of April	..	3	0
" May	..	3	1
" June	..	3	2
" July	..	1	0
" August	..	4	3
" September	..	3	2
" October	..	4	4
" November	..	2	1
" December	..	12	7
Jan.-March 1940	..	123	50
		190	87

The above table shows that more specimens of human viscera are submitted during the cooler months, December, January, and March, than any other period of the year. The so called "Vomiting sickness" occurs during this period, and difficulty and inconvenience is experienced in the Laboratory during these "rush periods" owing to lack of conveniences and shortage of staff.

Number of deaths.	Poison found.	Remarks.
1	Alcohol	ex a drowned male adult.
3	Arsenic	Three male adults
2	Arsenic and cresols	Two male suicides; took Cattle dip
1	Amyl alcohol and resorcinol	Female adult, took a hair preparation.
3	Antimony	3 persons, same family
1	Atropine	Male adult
1	Belladonna	Male suicide, took liniment
1	Bismuth	Female adult
1	Castor oil and toxalbumins	Castor seed poisoning
5	Cresols	Lysol, 3 suicides, 2 others
1	Cresols and alcohol	Male suicide, drank Rum and Jeyes mixed
2	Croton oil	
4	Glucosides	History of ackees in 2 cases
20	Hydrocyanic acid	From bitter cassava
2	Kerosine oil	Two infants
1	Lead	Male adult
3	Mercury	
1	Opium	Male Chinese
11	Phosphorus	From rat poisons
1	Potassium cyanide	Male suicide
1	Salicylic acid	Male adult
8	Saponins	All children, alleged to have eaten ackees
1	Tin	Male adult
1	Urechitoxin	Nightshade poisoning of a female child
1	Zinc	Female child
10	Ptomaines	9 cases from same place and at same time.

The distribution of specimens submitted for analysis for poison, other than viscera and vomits, follows the periodic variation. Out of a total of 213 specimens submitted over the 15 months period 80 were received during the first three months in 1939 and 60 during the first 3 months in 1940. Positive cases were found in 50 specimens. Poisons found comprised Arsenic, lead acetate, carbolic acid, Cooper's Dip, powdered glass, mercuric iodine, kerosine oil, permanganate of potash, phosphorus rat paste, zinc salts, antimony, oxalic acid, potassium cyanide, calomel, white precipitate, copper sulphate, copper carbonate, alum, and alkaloids of belladonna.

The number of certificates issued to the Police for 1939 was 543, and was 735 for the 1939-40 period. This represents a vast increase in the amount of Police work done.

Seventeen cases of crimes by shooting were investigated, and this involved a large amount of experimental work in addition to the examination of 265 exhibits, such as firearms, bullets, and clothing.

The Government Chemist attended Circuit Courts throughout the Island and gave evidence in many cases. Apart from Police work the Customs Department is the one to submit the next largest number of specimens. These are of a miscellaneous nature and involve questions as to rates of duty and drawback.

With the exception of analyses of milks which are done free of cost for the Government Stock Farm the samples submitted under the heading of "B" unofficial, are submitted by private persons who pay fees for the analyses. From the year the collection of Stamp Duty came into force, at the rate of two shillings for every certificate issued,

Unofficial specimens submitted for analysis for the presence of poison included eight of animal viscera and seven cases poison was found as follows:—

- (1) Arsenic in a cow
- (2) Lead in a rooster
- (3) Urechitoxin (nightshade) in a cow
- (4) Datura in a horse
- (5-7) Lead in three Jamaica coney, which died at the Jamaica Institute, probably from lead derived from paint as renovation work was being done at the time.

Some interesting problems in the corrosion of metals were investigated, and advice given. These come in connection with the laying of cables.

During this period the old Condensed milk plant was removed and replaced by a dual system of new Paraph boilers which are steam jacketed and which are better and safer than the old plant.

The Government Chemist was appointed a Member of the Rum Control Board.

The manufacture of Paraph, Fly killer and rat poison was continued throughout the period. The following table shows the principal articles issued to the public, and the receipts for fees, sales and stamp duty.

Items.	1939.	1939-40.
Paraph, lbs. sold	36,588	46,689
Arsenite of Soda, lbs	20,150	25,675
Carbon bisulphide, lbs.	1,234	1,401
Rat poison, lbs.	63	82
Rat poison, 1 oz. packets	176	246
Thymol powders, oz. packets	140	149
Standard Iodine solution, ccs	29,000	39,750
Starch solution, bottles	170	228
Soda bicarbonate, bottles	32	50
Testing cylinders	17	26
Cyanogas, lbs.	63	63
Fly killer, gallons	676	784
Book poison, gallons	3½	25
Laboratory fees	£295 6 9	£361 16 3
Laboratory sales	£984 19 8	£1,223 2 3
Stamp Duty	£3 6 0	£10 6 0

The title of Deputy Island Chemist was abolished during the early part of 1939 and the title Government Chemist was legalised so as to bring Jamaica into line with other Colonies.

W. L. BARNETT,
Government Chemist

(xiv) Report of the Entomologist.

Staff.

The Entomologist returned to the Island on 27.2.39: since last December he is also acting as Plant Pathologist. The Technical Assistant was appointed Acting Junior Agricultural Officer and Messrs. Bullock and Technical Assistants.

The appointment of those two graduates from the Jamaica School of Agriculture who had no training in entomology has not yet relieved pressure of work caused by the rapid and necessary extension of the Entomology Service.

Extension Work and New Buildings.

An Insectary, a Museum of the Building Industry and an office for the Termite Control Bureau were built. The volume of advisory work concerning agricultural pests continued to increase steadily as also the work for other Government Departments and Institutions of public utility.

The Entomologist served on a Committee appointed to submit recommendations for the protection of the fauna of the colony and of its Dependencies and also on a Committee to organize the Science Museum and of the Institute of Jamaica. His services were utilized by the Central Housing Authority, the Water Commission, Department of Public Works, Parochial Boards, Department of Education, the Record Office, various schools.

Control of pests affecting food crops, by improving agricultural practices and preservation of agricultural products in storage also called for increased attention.

Special Courses of Lectures and Demonstrations.

Special series of lectures and demonstrations were organized—

- (a) for the Instructors of the Jamaica Agricultural Society (many of whom had been recently appointed);
- (b) for the Senior Officers of the Department of Public Works (evening lectures);
- (c) for meetings of members of the Agricultural Society.

The Entomologist addressed the annual meeting of the Association of Sugar Technologists to review the present economic significance and potentialities of pests and diseases affecting sugar cane in the various cane growing areas of the colony. This lecture was subsequently published in the Journal of the Association of Sugar Technologists.

Publications.

Articles and Pamphlets dealing with entomological problems were regularly published in the Journal of the Agricultural Society and several extracts were published in the daily press.

A special series of pamphlets sold at 2/6 per copy to cover costs entailed was started with the publication of a Bulletin entitled "The Preservation of Wooden Buildings in the Tropics". The first edition having been exhausted within a year, others are being prepared.

A comprehensive and illustrated Report on Termites was submitted for transmission to the Director of the Imperial Institute of Entomology.

AGRICULTURAL ENTOMOLOGY.

Banana.

Considerable success has been met in establishing and distributing the beetles *Placcius javanus* and *Dactyloster-hydropiloides* which prey on the Banana Weevil Borer.

Localized outbreaks of the scale insect *Chrysomphalus aonidum* and of the mite *Tetranychus telarius* occurred.

Citrus.

During the period under review the following diseases were found affecting Citrus:—

Scab (*Sphaeceloma fawcettii*) appeared early in March on the Marsh Seedless grapefruit, in a severe form, in the Moneague district and subsequently in other districts in St. Ann and Manchester. An experiment at Moneague showed that spraying with Perenox at the rate of 40 ozs. per 100 gallons at tri-weekly intervals gave satisfactory control; Bordeaux mixture was also successfully used.

Thread Blight (*Corticium koleroga*) has been found attacking grapefruit.

Chocolate Spot of Citrus (*Cladosporium citri*) was found doing minor damage to orange seedlings.

Knot (*Sphaeropsis tumefaciens*). Many cases practically restricted to limes came under observation.

Die-back and *Gummosis* have been noted from time to time.

A special survey was made in the Packing Houses to assess the amount of rejections caused by various pests diseases and by mechanical injury to the fruit.

Pests affecting economic plants.

The following species were recorded:—

Halicta jamaicensis F. and *H. satellitia* Jac. affecting Okra.

Cylindra flava F. on Pimento.

Phthia picta Dru. *Leptoglossus phyllopus* L. and *Margaronia hyalinata* L. on Watermelon.

Mylabris oblectus Say. *Corythuca gossypii* F. *Ceratoma denticollis* F.

Lamprosema indicata F. *Mocis punctularis* Hubr. *Ephestia* sp.

Anticarsia gemmatalis Hubn. on Beans.

Coccus mangiferae G. on Avocado.

Selenothrips rubrocinctus Giard. and *Coccus mangiferae* G. on Mango.

Termites. *Lachnosterna jamaicensis* Arrow. *Laphygma frugiperda* Sm. and Abb. *Metamasius sericeus* Oliv., *Diatraea saccharalis* on Sugar Cane.

Selanaspidus articulatus Morg. and *Coccus hesperidum* L. on Coconut.

Saissetia oleae Bern. and *Pachneus marmoratus* Mshll. on Tropical Almond.

Celerio lineata lineata Ochs. *Prodenia ornithogalli* Guen. *Protoparce sexta jamaicensis* Br. *Pathorimaca operculella* Zell. and *Lasioderma serricorne* F. on Tobacco.

Protoparce sexta jamaicensis Br. *Heliothis obsoleta* F. and *Leptoglossus gonagra* F. on Tomato.

Solenopsis geminata F. *Plutella cruciferarum* Zell., and *Aphids* on Cabbage.

Fiddler Beetles *Prepodes vittatus* Gaph. *Lepidosaphes beckii* Newm.

Chrysomphalus aonidum L. *Selanaspidus articulatus* Morg. *Ligyrus tumulosus* Burn. *Saissetia hemisphaerica* Targ. *Strategus tilanus* F. *Coccus viridis* G. Aphids and *Oiketicus abbottii* Grote. on Citrus.

Larvae of the Scarabeid beetle *Lachnosterna jamaicensis* did extensive damage to pastures (of the type locally known as 'Commons').

PLANT INSPECTION SERVICE.

The Plant Inspection Service was carried out under the guidance of the Entomologist by Mr. E. Tai up to August 16th, when Mr. E. D. H. Weller took over the duties.

Section of Fruit and Vegetables:—

Passed for Consumption in Jamaica	9,836 packages
Passed for Transshipment (mainly vegetables)	159 "
Not admitted	25 "
	10,010 "

The major portion of importations which consisted mostly of apples, grapes, plums and pears, came from the United States of America, Canada and New Zealand. Vegetables imported were mostly lettuce, celery, cabbage, broom and cauliflower.

Section of Imported Plants:—

Passed	272 packages
Destroyed	22 "
	294 "

The majority of these came from the U.S.A. and the United Kingdom; others from Holland, Australia, Canada, India, Trinidad, Barbados, Singapore, Bengal and Belgium.

Potatoes.

Importations were as follows:—

From Canada	11,463 barrels
From Ireland	950 "
	12,413 "

Agricultural Machinery.

On one occasion used sugar machinery was imported.

Health Certificates.

Fifty-six Health Certificates were issued concerning mainly ornamental plants exported to: England, U.S.A., Costa Rica, Cuba, British Honduras, Colombia, Brazil, Mexico, Panama, Barbados, Dominica, Turks Island, Burma, Kenya, Tanganyika, Gold Coast and the Belgian Congo.

Seeds of economic plants were also largely exported chiefly by the Agricultural Department.

Other items of agricultural interest inspected during the year were:

- 78 Christmas Trees from Canada
- 1 package Mushroom Spawn from the U.S.A.
- 2 bales Peat Moss from the U.S.A.

W. H. EDWARDS,
Government Entomologist.

(xv) *Report of the Agricultural Chemist.*

The Assistant Agricultural Chemist was appointed to act as Agricultural Chemist as from the 31st July.

1. SUMMARY OF LABORATORY ANALYSES.

A. Soil Samples—General	..	..	..	1,856
B. Soil Samples—Base Exchange Analysis	..	..	..	126
C. Other General Laboratory Analyses:				
Bat Manures	..	..	..	21
Fertilizers	..	..	..	10
Irrigation and Well Waters	..	..	..	40
Cane Juices	..	..	..	20
Molasses and Sugar Products	..	..	..	3
Marls, Limes and Limestones	..	..	..	6
Miscellaneous	..	..	..	8
				108
D. Food Analyses:				
Beans and Peas	..	..	..	6
Maize	..	..	..	70
Ground-nuts	..	..	..	86
Citrus Juices	..	..	..	150
Fodders	..	..	..	14
Miscellaneous	..	..	..	23
				349
E. Plant ashes	..	..	..	34
Total Samples examined				2,473

2. SOILS.

The soils of the Westmoreland Inland Basin which is one of the largest sugar producing areas in Jamaica investigated and manurial recommendations made. The soils have particularly high toxic sub-soils and are very in available potash, phosphate and lime.

The coconut soils of St. James and Hanover were examined in connection with the "West End Bud Rot" coconuts. The area subject to disease was found to exhibit very unfavourable water relationships.

Similar soils in St. Thomas produced good coconuts because of the heavy all year round precipitation of rain.

Investigations into the exchangeable bases of limestone soils were conducted and information obtained at soil toxicities and the relation base exchange between terra rossa and degraded terra rossa soils.

The analysis and survey of soils from properties for advisory purposes formed a prominent feature of the work together with the analysis of soils from field experimental plots.

Attention was drawn to the classification of Jamaican soil types according to their erodibility and soil chemical aspects affecting the erosion of these soils with recommendations for erosion control have been made.

3. FOLIAR ANALYSIS.

The ash analysis of coconut leaves for major plant nutrients by chemical methods, and for minor elements by spectrograph, was carried out. The soil supporting the palm affects the chemical composition of the foliage more than any apparent pre-disposition to the "West End Bud Rot."

4. FOOD CROP INVESTIGATIONS.

The introduction, selection and multiplication of the more promising varieties of food crops have been continued at the different centres. This work is being extended to include the planting community. A summary of behaviour of the more promising varieties on the different soil types has been drawn up.

The results of the experiments reaped since the commencement of the work have been analysed statistically and conclusions drawn. New experiments have been laid down involving the manuring and spacing of maize on terra rossa soils, the manuring of ground-nuts, red peas, Irish potatoes, sweet potatoes and soya beans on terra rossa soils and the manuring of maize on highly acidic Inland Basin soils. Results prove conclusively that potash is the main limiting manurial factor on terra rossa soils and phosphate (and possibly liming) on degraded terra rossa soils. This work is now being extended and experiments are being laid down on private estates in conjunction with plantations.

In the Laboratory, the effect of manuring food crops on the nutritive composition of the crop grown has been studied. The chemical composition of peanuts in particular is very susceptible to manuring.

The relation between specific gravity and the starch content of bitter cassava as a possible means of purchasing this crop on a starch content basis, was investigated.

5. FIELD CROPS.

(a) *Sugar Cane*.—A survey of the yields of sugar cane for the Island with special reference to soil type, ecological conditions and varieties was made for the 1938-39 crop. Weekly sugar factory reports were collected from all factories and summarised and circulated to the factories. The tons cane per ton of sugar was the lowest recorded, viz., 9.

The laying down and reaping of sugar cane experiments was continued, limited only by personnel available for supervision. Twenty-six experiments were involved.

(b) *Citrus*.—Two manurial experiments on terra rossa soils have yielded valuable results concerning the effect of manures on the early growth of grapefruit trees and on the chemical composition of the fruit. Manuring improved the composition of the fruit significantly. A young manurial experiment with grapefruit on Inland Basin soils yielded preliminary information on the effect of manuring upon the establishment of a citrus orchard on the highly acidic, phosphate deficient, soils.

(c) *Bananas*.—All experiments were handed over to the administration of the Banana Leaf Spot Control Division.

Weather.—The acute drought during the autumn followed by the very heavy rains and high winds of November caused considerable damage to all field experiments, especially to the small crops.

R. F. INNES,
Ag. Agricultural Chemist.
31.8.40.

(xvi) Report of the Botanist.

From the commencement of the year to the 27th of February, the Botanist acted as Government Entomologist. From the 6th of December to the 31st of March acted jointly with the Entomologist as Government Plantologist.

The activities of this Division have increased considerably due to extension of the banana breeding programme and the inauguration of a seed maize improvement campaign. Advisory botanical work consisting of identification and advice on native plants, weeds and crop plants has been continued. An experiment laid down in St. Thomas on the methods of controlling the pasture weed, Red Tamarind (*Acacia villosa* Willd.) is still incomplete.

BANANA BREEDING.

Breeding work progressed satisfactorily until November when the majority of the breeding plants were blown over 80% of the hanging pollinated fruit was lost. More serious was the loss of immature plants which have provided breeding material in the next few months, in consequence the number of pollinations carried out in December and March fell to negligible proportions. 5,589 stems were pollinated during 1939 representing an increase of 65% over the previous year; the increase in seedling output was over 100% being 1,092 in 1939 as against 516 in 1938.

Breeding has continued on all the plots which were in operation last year and in addition five new stations have been established. The plots which were planted at Borobridge, Guy's Hill and Fellowship during 1938 have come into bearing and are now being used for breeding. Climatic conditions generally were favourable to the setting of seed, an increase of over 100% in the number of fertile (seminiferous) stems occurred and this, coupled with an increase in the average number of seed per fertile stem, has brought the seed yield up to 7,000, being 265% more seed than obtained in 1938.

The crosses carried out in previous years have been continued on a larger scale and in addition two new wild types have been incorporated in the programme. These are *Coolie Hongkseng* a variety of *Musa balbisiana* which hitherto failed to set seed in crosses with *Gros Michel*, and the wild type 'Annam.' Unfortunately all the fruit obtained from the latter were blown down in November. The standard crosses, *Gros Michel* x *M. acuminata* and *Atta 4* have been continued on a larger scale and the cross, *Gros Michel* x '*Pisan Lilan*', commenced last year, yielding a good supply of seedlings none of which have yet fruited.

Backcross.—A few pollinations of *Gros Michel* by seedling pollen were again carried out; very few seed were set and only one of the nine seedlings survived to be planted out and this shows little promise of commercial value.

2 cross.—A noteworthy feature is the increase in this cross from 650 pollinated stems last year to 2,176 this year with a view to the more complete investigation of the possibilities of this family. The majority of these crosses were S.19 x S.19 but in 300 crosses the more recent seedlings were used. The set of seed and germination were good, but the seedlings are still young.

Of the 1,092 seedlings raised, 739 were derived from the *Gros Michel*, and *Highgate* varieties crossed with *M. acuminata*, '*Calcutta 4*' and '*Pisan Lilan*'. Of the remainder, 344 are F2 and 9 are backcross seedlings. 214 of the seedlings in the seedbox stage and 166 approximate heptaploids will be discarded.

During the period under review the first fruit of 213 new seedlings was reaped. Owing largely to the irregularity of summer rainfall most of this was poor as compared with that of the last few years. It is impossible therefore to compare these seedlings with previous ones and they are being multiplied before selections can be made.

Introductions.—Of the wild types introduced from the East during the last few years, seven more have been planted in the breeding plots for use next year and three have already come into use. Nine more introductions have been received from Assam, two from Burma and one from New Guinea. With the exception of four of Assam samples the germination was good and seedlings of all but the New Guinea varieties which arrived late in the year have been established in the field.

Variety Trials.—The two randomised plot variety trials in St. Mary and Vere laid down in 1938 and early 1939 respectively have grown well. The former commenced shooting in the early summer but as a result of the drought the fruit was poor and only half the fruit had been reaped when the plot was blown down in November; the plot was put back with a view to obtaining as uniform as possible a ratoon crop in 1940. The Vere plot was only half reaped in November and survived the storm without damage.

Seedling nursery plots and multiplication plots have been extended by over five acres and an addition of seven acres has been made to the plots in St. Mary in which seedlings are tested for resistance to Panama Disease. In 1939 56 seedlings have undergone test in these latter plots and so far 50 have contracted the disease of which cases occurred this year. Owing to the dry conditions which prevailed the rate of infection was slow.

MAIZE IMPROVEMENT.

In the autumn of 1939 funds were provided to commence work on a seed corn (maize) improvement scheme with the immediate object of producing a higher yielding yellow variety suitable for milling. In connection therewith the Botanist paid a brief visit to the U.S.A. to study maize improvement methods there. Owing to the date of commencement of the scheme it was impossible to select the basic stock in the field and 1,000 ears were therefore selected from a harvested crop of the red hulled local variety grown at Grove Place Experiment Station. The seed was sown on the ear-row principle in two plots, a seven acre plot in Vere in which seed from 1,000 ears was planted in 16 rows for straight-forward mass selection and a one acre plot at Hope planted from 500 re-selected ears for individual selection. On both plots a heavy outbreak of the Corn Ear Worm *Laphygma frugiperda* commenced shortly after germination and in spite of applications of lead arsenate dust and nicotine sprays successive infestations continued the plants at both plots. Further damage occurred at both plots from the flood rains of November. The plots were therefore replanted in the Spring with selections from both plots combined with the residues of the original seed. In addition a selection and in-breeding plot was established at Hope with the multi-rowed yellow variety grown in St. Elizabeth. While the unfortunate combination of adverse climatic and biological factors retarded progress being made in the direction of improving yielding capacity, definite progress in the standardisation of colour and the elimination of the darker coloured pericarp can be claimed.

INSECT PESTS.

During the absence of the Entomologist on leave in which the Botanist acted as Entomologist no outbreaks of importance occurred. The activities of the Division were concerned mainly with routine advisory work, particularly with the control of termite infestation in buildings.

A consignment of parasites and predators of the Pineapple Mealy Bug were received from Hawaii in January including the parasitic wasp *Hambletonia pseudococcinea* and the coccinellids *Hyperaspis* sp. and *Diomus* sp. These were used in the pineapple plots at Hope where mealy bug was occurring.

MISCELLANEOUS.

Special reports have been submitted on various aspects of banana breeding and on a visit to the U.S.A. in connection with the Maize Improvement Scheme; an article has been published in the Journal of the Jamaica Agricultural Society entitled 'Banana Varieties in Jamaica' and a lecture on 'Progress in Banana Breeding' was given by the Field Staff of the Department and the Society in connection with the annual summer course at Hope.

In conclusion I wish to record my sincere thanks to the owners, executives and staffs of estates who willingly co-operated and without whose assistance the work of this Division could not have been carried out. I am particularly indebted to Messrs. Agualta Vale Ltd., Messrs. Hawkins and Scott, P. Junor, Esq., P. Lind, New Yarmouth Estate Ltd., Potosi Estates Ltd., and the West Indies Sugar Co.

L. N. H. LARTER,
Government Botanist
12.

(xvii) Report of the Plant Pathologist.

From November 1939 to the end of March the work of this Division has been supervised by the Entomologist and Botanist jointly, the latter dealing with crops other than Citrus and Sugar Cane. This report however covers the whole period from January 1st 1939 to March, 31st 1940.

BANANAS.

Work in connection with Cercospora Leaf Spot has been handed over to the Leaf Spot Control Division and is not, therefore, dealt with here.

Panama Disease (*Fusarium cubense*) has continued its steady spread through banana cultivations. The number of cases treated amounted to 906,613, the percentage increase being approximately the same for the last three years. The number of new cases recorded, 3,667,—cases in previously healthy fields—shows a falling off as compared with 5,248, and 4,535 for the two previous years, due in some part to the prolonged drought of the summer of 1939 in some part to the impossibility of the available staff keeping track of all cases which occur. A steady increase in new outbreaks has occurred in parishes with a lower total incidence, St. Ann, Trelawny and St. Elizabeth. Infected parishes have produced fewer new cases with the exception of St. James. There is no doubt that the disease is still largely spread by the use of infected planting material.

Experiments inaugurated early in the year by Mr. Ward to test the efficacy of colloidal cuprous oxide in controlling the disease have been kept under observation but no conclusive results have been forthcoming, due to the slow spread of the disease under the dry conditions which prevailed. The experimental plants were killed in November and the experiments will require repetition before reliable conclusions can be drawn.

Following the storm of November a form of leaf Die Back which has not been previously recorded occurred in one property in St. Mary. The condition took the form of a progressive browning of the leaf from the necrotic area being sharply delimited from the normal tissue of the lower part of the lamina. No pathogenic organism was associated with the condition which has now disappeared and it was attributed to physiological disturbance following wind damage. A number of cases of bacterial heart rot were observed in plants damaged by the storm.

Several alleged cures of Panama Disease have been reported and are under investigation but so far none has proved effective.

COCONUT (*Cocos nucifera*).

Bronze Leaf Wilt is still the most serious disease of Coconuts but remains confined to the North-West Island where it is still spreading in the parishes of St. James and Hanover. Approximately 4,000 acres have been affected and 1,000 acres destroyed since this outbreak commenced in 1934.

Many cases of physiological wilt were reported on the North side of the Island which proved to be due to old trees growing on unsuitable soils and were attributed to wind damage of the crown. The condition disappeared as the more severely blown trees have died and the less seriously affected have recovered.

Cases of Bud Rot due to *Phytophthora palmivora* and Bitten Leaf due to *Thielaviopsis paradoxa* proved to be uncontrollable.

PIMENTO (*Pimenta officinalis*).

Rust caused by *Puccinia psidii*, the only serious disease affecting this crop has proved impracticable to control. The disease has still failed to appear in serious form at altitudes of less than 1,000 feet and some degree of resistance is noted at higher altitudes.

COFFEE (*Coffea arabica*).

No serious outbreaks of diseases have occurred on this crop. American Blight (*Stilbella flavidula*) has appeared occasionally.

MANGO (*Mangifera indica*).

Powdery mildew (*Oidium mangifera*) caused a serious loss of blossom in 1939, but has proved controllable by sulphur dusting. A few cases of Leaf Blight due to *Pestalotzia funerea* were noted on wind blown trees.

TOBACCO (*Nicotiana tabacum*).

Mosaic is still the most widespread and serious disease of this crop. Other diseases which have been recorded include Wilt (*Fusarium lycopersici*), Root Rot (*Thielavia basicola*), Black Shank (*Phytophthora nicotianae*), Frog Eye Spot (*Cercospora nicotianae*).

POTATO (*Solanum tuberosum*).

The most important diseases of this crop, Early Blight (*Alternaria solani*) and Late Blight (*Phytophthora infestans*) have been kept under control by spraying. Cases of Collar and Root Rot due to *Rosellinia* spp. and Wilt (*Fusarium oxysporum*) were recorded.

TOMATO (*Lycopersicum esculentum*).

the Blight (*Phytophthora infestans*) and Leaf Mould (*Cladosporium fulvum*) have been common but not serious spraying has been regular. A high percentage of rejected fruit which occurred early in 1940, proved on examination to be due mainly to causes other than fungal infection. The fungi, *Phoma destructiva* and *Fusarium* are responsible in a small degree.

Other disease reported and investigated included:—

beans (*Phaseolus vulgaris*) affected by Rust (*Uromyces appendiculatus*)
 beans (*Phaseolus vulgaris*) affected by Chlorosis (Virus)
 ground-nut (*Arachis hypogea*) affected by Rust (*Puccinia arachidis*)
 cane (*Saccharum officinarum*) affected by Root Rot (*Marasmius sacchari*)
 capefruit (*Citrus maxima*) affected by Scab (*Sphaceloma fawcettii*)
 capefruit (*Citrus maxima*) affected by Melanose (*Phomopsis citri*)
 capefruit (*Citrus maxima*) affected by Flyspeck (*Leptothyrium citri*) —
 lime (*Citrus aurantifolia*) affected by Wither Tip (*Gloeosporium limetticolum*) —
 lime (*Citrus aurantifolia*) affected by Knot (*Sphaeropsis tumefaciens*)
 maize (*Zea mays*) affected by Smut (*Ustilago zeae*)
 pamp Rice (*Oryza sativa*) affected by Leaf Spot (*Septoria tritici*?)
 lime (*Boehmeria nivea*) affected by Leaf Spot (*Gloeosporium* sp.)
 peach (*Prunus persica*) affected by Rust (*Tranzschelia punctata*)
 paw (*Carica papaya*) affected by Mosaic (Virus)
 paw affected by Leaf Spot (*Pucciniopsis caricae*)
 rose (*Rosa* sp.) affected by Black Spot (*Diplocarpon rosae*)
 rose affected by Rust (*Phragmidium subcorticatum*)
 lime affected by Leaf Spot (*Cercospora atricincta*) —
 raising hybrid orchid seedlings by the asymbiotic method devised by Mr. F. E. V. Smith has been resumed
 number of healthy seedlings are now growing.

L. N. H. LARTER,
 Acting Plant Pathologist.
 16.5.40.

(xviii) Report of the Leaf Spot Control Officer.

Leaf Spot Disease of bananas was first reported in Jamaica in 1936, and a summary of its development and the measures which led to the appointment of the Banana Leaf Spot Control Advisory Board and finally to the establishment of the Leaf Spot Control Division of the Department of Agriculture is given.

The functions of the new Division were to assist in launching the spraying campaign in Jamaica and to be responsible for the distribution of materials and equipment for spraying, to ensure that these materials were properly used and to conduct investigations on the control of the disease and all aspects of banana cultivation. The Division commenced operations on July 1st, 1939.

For the purpose of administration, the Island is divided into two main sections—the Western Division and the Eastern Division, and the Eastern Division has a sub-division described as the Central Division.

During the period under review, leaf spot disease has become a serious factor in banana production throughout the Island with the exception of certain areas in the parishes of St. Thomas and Portland.

The three Fruit Companies have undertaken to supervise the spraying of their contractors, but before equipment and materials were issued to growers inspection of the areas to be sprayed was made by an Officer of the Division. Disease Inspectors assisted later in this work. Inspection of 1,150 cultivations have been made.

Investigational work has been held up as it was not possible to obtain the services of a Mycologist until the end of February. Further, the supervisory work was greater than had been estimated and it was necessary to devote full time to spraying supervision in the initial stages. The original scheme for fertilizer investigations was included and a report prepared, summary of which has been published. The investigations have given some indications of the correct procedure for fertilizer treatment with bananas.

The Officers of the Division have assisted in the Food Production campaign.

Leaf Spot Control Board.—

The Banana Leaf Spot Control Board was appointed in July, 1939, to administer a grant of £200,000 made by the Government to the banana industry for the purpose of establishing measures for the control of leaf spot disease of bananas in the Colony. The funds available to the Board were inadequate to provide for the whole of the area of bananas in Jamaica which it is estimated can be sprayed economically, but economies in procedure developed as experience was gained and greatly increase the area which can be sprayed under the scheme. The Board provided sulphate and lime for Bordeaux Mixture, and Perenox. Distribution was made through the agency of the masters of the Jamaica Government Railway and agents of the Fruit Companies in certain areas which otherwise could not serve.

Considerable difficulty has been experienced in providing suitable equipment for the small grower and in many cases it can only be overcome by these growers sharing a unit of equipment. The total number of growers supplied with equipment up to March 31st, 1940, amounted to 1961. Monthly supplies of material have been made for approximately 50,000 acres. Further issues of equipment are proceeding. The following tables give details of the equipment and materials which have been supplied to the 31st March, 1940:—

(i)
Equipment Issued.

	U.F.Co.	S. F. Co.	J.B.P.A.	Total.
Units supplied ..	252	193	365	810
Units owned by Growers ..	63	27	99	183
Growers Spraying ..	722	337	902	1,961
for which materials have been supplied by Board ..	13,645	7,609	27,936	49,190
for which equipment is available	8,318	6,588	13,908	28,814

(ii)

Materials Supplied

(Quantities given in tons)

		U.C. Co.	S.F. Co.	J.B.P.A.	Total
"X" Total Monthly issue allowed for units in use at 31.3.40	CUSO 4	152	98	106	356
	Lime	152	98	106	356
	Per.	3	4	5	12

"X" This amount increases as further units of equipment are issued.

A financial statement of the Board is attached.

STATEMENT OF EXPENDITURE, BANANA LEAF SPOT CONTROL BOARD.

Period 8th August, 1939 to 30th March, 1940.

	£	s.	d.
By 1. Purchase of Equipment	28,767	19	0
2. Purchase of Materials	63,112	16	2
3. Local handling charges and freight	3,862	1	11
4. Storage charge and Insurance on Materials	600	19	8
5. Personal Emoluments	366	14	4
6. Travelling	119	15	4
7. Office Fixtures and Stationery	150	15	2
	£96,981	1	7

Certified correct.

(Sgd.) C. E. STREET,
Accountant.

(Sgd.) G. A. JONES,
Chairman, B.L.S.C.B.

(Sgd.) J. L. WORLEDGE,
Auditor General

D. PUBLICATIONS.

The following departmental publications were issued during the period 1st January, 1939 to 31st March 1940:
 Bulletin No. 18 (New Series)—"Reprint of Miscellaneous Articles 1937"
 Bulletin No. 20 (New Series)—"Field Experiments on Sugar Cane in Jamaica, 1936-1939"—Rep
 H. H. Croucher and M. S. Goodman.
 Bulletin No. 21 (New Series)—"Forestry and Erosion in Haiti and Puerto Rico" by C. Swabey
 "The Preservation of Wooden Buildings in the Tropics" by W. H. Edwards.
 Annual Report 1938.

SECTION III—LEGISLATION.

LEGISLATION AFFECTING AGRICULTURAL INDUSTRIES.

A. Laws relating to Agriculture passed during the period 1st January, 1939 to 31st March, 1940.

No.	Date Assented to	Short Title.	Chief Provisions.
20	22 May, 1939	Banana (Leaf Spot Control) Loan Law, 1939	To authorise the Governor to raise by the issue of a loan money for assistance in the treatment of Cercospora Leaf Spot of Bananas.
21	19 June, 1939	Banana (Leaf Spot Control) Law, 1939	To afford assistance to the banana industry in the treatment of Cercospora Leaf Spot of Bananas and to create by means of a cess a reserve fund for the relief of the industry; to establish the Banana Leaf Spot Control Board to administer such amounts as may be raised under the provisions of the Banana (Leaf Spot Control) Loan Law, 1939, and such sums as may be approved by the Legislative Council.
41	17 August, 1939	Coconut Industry Control Law, 1939.	To control the Coconut Industry of the Island. (i) Creating a Coconut Marketing Board to regulate trade in Coconut products and to be sole dealer in copra. (ii) Appointing a coconut Control Authority to make rules for the regulation of the coconut industry and to institute a system of licensing of dealers in coconut products and registration of growers.
44	24 October, 1939	Tobacco Duty (Amendment) Law, 1939	To increase the duties on cigarettes manufactured in the island.
53	1 November, 1939	Coconut Oil Products (Excise Duty) Law, 1939	To impose excise duties on coconut oil products manufactured in Jamaica.
54	1 November, 1939	Edible Oil Dealers (Licence) Law, 1939	To provide for the licensing of dealers in coconut oil and the imposition of duties in connection therewith.

B. Orders, Regulations, Proclamations, etc.

e.	Jamaica Gazette.	Description.	Subject.
39	12.1.39	Proclamation under Customs (Importation Prohibition) Law, 1916. (Cap. 176)	Prohibition of importation of condensed milk into the island.
2.39	16.2.39	Proclamation and Order Under Customs (Importation Prohibition) Law, 1916. (Cap. 176).	Prohibition of importation of Seed Potatoes except by Marketing Divisions of Department of Science and Agriculture and Jamaica Agricultural Society.
3.39	30.3.39	The Export of Plants (Banana Suckers) Prohibition Proclamation 1939. (Cap. 348).	Prohibition of export of banana suckers except under special permit of the Director of Agriculture.
7.39	15.7.39	Proclamation under the Customs (Importation Prohibition) Law, 1916. (Chapter 176).	Prohibition of importation of cornmeal machinery.
8.39	18.8.39	Proclamation under the Customs Consolidation Law, (Cap. 176 of the Revised Edition)	Prohibition of importation of cornmeal.
9.39	24.9.39	Citrus Fruits (Export) Regulations 1939 made under the Agricultural Produce Law. (Cap. 339).	Appointment of Marketing and Trade Commissioner sole exporter of citrus fruit to New Zealand and bitter oranges to all markets; establishment of a system of registration of citrus shippers.
12.39	21.12.39	Proclamation under the Customs Consolidation Law. (Cap. 176)	Prohibition of importation of citrus crates used as containers for merchandise.
13.39	27.3.39	Notice under Customs (Importation Prohibition) Law 1916. (Chapter 176).	Permission to import Condensed Milk under License from the Collector General.
1.39	18.5.39	Order under the Package Tax Law, 1939 (Law 11 of 1939),	Exemption of Seed Potatoes from the duty imposed by the Law.
1.39	6.7.39	Order under the Sugar Industry Control Law, 1937. (Chapter 302).	Fixing Quota period as from 1st September, 1938 to 31st August, 1939 and fixing the Island Quota at 123,960 tons, Island Export Quota 109,960 tons, Local Consumption Quota 14,000 tons, Island Muscovado Quota 130 tons.
10.39	19.10.39	Regulations under the Agricultural Produce Law. (Cap. 339).	Prohibition of the sale or purchase for export of bananas unfit for export.

APPENDIX I(a).

Report of the Food Production Board.

The Food Production Board was appointed under the Emergency Powers Defence Act to promote the local production of foodstuffs. The main factor restricting the production of foodstuffs in the past was that there was no guarantee of purchase at a stated price. Growers who desired to avail themselves of these guarantees were required to register with the Board stating the areas of each crop they proposed to grow.

The Instructional Staff of the Jamaica Agricultural Society was doubled and all instructors were engaged in the production campaign. The Society also undertook the distribution of seed and planting material. The Government Marketing Department has undertaken the purchase and resale of produce offered to the Board under the guaranteed prices scheme.

A Committee of the Board was appointed to investigate the possibility of rice production in the Black River area.

The increase of livestock in the Island was promoted by the establishment of a Livestock Division of the Department of Agriculture. Thirty Government controlled stud stations have been established throughout the Island.

A Fish Committee was appointed to make recommendations for the increased production of fish. Steps which have been taken are the formation of fishermen's guilds, provision of loans for fishermen and recommendation for the establishment of an experimental cold storage primarily in Kingston.

The Agricultural Loan Societies Board undertook to make provision for loans to growers through the Agricultural Loan Banks. Thirty-eight new loan banks were formed, making a total of 94. Steps were taken to promote the use of crop liens.

The Board appointed a committee to report on the problem of the availability of land for food production and recommendations have been made to Government.

A committee of the Board has been appointed to advise the Board on the relation of the food crop scheme to protein deficiency and general nutrition.

A committee of the Board has also been appointed to prepare a scheme for the establishment of a collective

APPENDIX I (b).

Annual Report of the Live Stock Officer for period 1st April 1939 to 31st March, 1940.

In order to encourage increased production of livestock, as well as the improvement of the type of livestock raised, a Live Stock Division was established under the Food Production Board, and a Live Stock Officer appointed with the necessary staff.

The object of the Live Stock Division is—

- (a) to increase the numbers of livestock raised in the Island.
- (b) to improve the type of the livestock raised.
- (c) to improve the feeding conditions for livestock.
- (d) to encourage more mixed farming.

ORGANIZATION.

The livestock work is under the supervision of the Live Stock Officer, with the headquarters at Hope purposes of administration, the Island has been divided into three Divisions, with a Live Stock Field Officer in of each Division.

Two Dairy Extension Field Officers were also appointed under the Dairy Extension Scheme, to assist in imp the Dairy Industry. One Dairy Extension Field Officer was appointed by the Jamaica Milk Products Co to undertake similar work.

DAIRY EXTENSION SCHEME.

A Dairy Extension Scheme, financed by the Government and the Jamaica Milk Products Co., Ltd organized in May and under this Scheme 10 Live Stock Improvement Centres were established.

LIVE STOCK IMPROVEMENT CENTRES.

With the outbreak of War it was decided to increase the number of Live Stock Improvement Centres and result 22 more Centres were established bringing the total up to 32. These Centres were well distributed over Island, and at each Centre there is standing for service a Dairy Bull, a Ram Goat and a Boar. No service charged for the use of the animals at any of the Centres.

LOCATION OF THE LIVE STOCK IMPROVEMENT CENTRES.

<i>St. Thomas:</i> ..	(1) Serge Is., Seaforth	(1) East Potosi, Bath
<i>Portland:</i> ..	(1) Chepstowe, Skibo	(1) Seaman's Valley, Pt. Antonio
<i>St. Mary:</i> ..	(1) Cape Clear, Clonmel	(3) Lambkin Hill, Gayle
<i>St. Catherine:</i> ..	(3) Treadways, Ewarton	(3) Dint Hill, Linstead
	(2) Lanyon, Spanish Town	(1) Bartons
<i>St. Andrew:</i> ..	(1) Hope, Kingston ..	(1) Golden Spring
<i>Clarendon:</i> ..	(1) Kellits	
<i>St. Ann:</i> ..	(1) Alexandria Pen, Alexandria	(1) Content Farm, Bamboo
	(3) Ramble, Clarendon	(1) Retreat, Brown's Town
<i>Manchester</i> ..	(3) Redbury, Porus ..	(1) Grove Place, Mile Gully
	(1) Holmwood, Christiana.	
<i>St. Elizabeth:</i> ..	(2) Cross Keys	(1) Bonavista, Myersville
	(2) Melksham, Rose Hall	(1) New Market
	(1) Spice Grove	
<i>Trelawny:</i> ..	(1) Spring Garden, Albert Twn.	(1) New Forest, Duanvale
<i>Westmoreland:</i> ..	(1) Myersville, Darliston	(1) Greenwich, Bethel Town
<i>St. James:</i> ..	(2) Glasgow, Adelphi	(1) Flamstead, Mtn., Maroon Twn.
<i>Hanover:</i> ..	(2) Great Valley	

Note.—(1) Live Stock Improvement Centres under Department of Agriculture, Food Production Board
(2) Live Stock Improvement Centres under Department of Agriculture, Dairy Extension Scheme
(3) Live Stock Improvement Centres under Jamaica Milk Products Co., Ltd.

IMPORTATION OF LIVE STOCK.

Owing to the shortage of purebred dairy cattle, pigs and goats, it was considered advisable to make import of these classes of livestock. During the year the following animals were imported:

From Canada—	From United States of America—
5 Guernsey Bulls ..	10 Jersey Bulls
2 Jersey bulls ..	2 Toggenburg Rams
3 Berkshire Boars ..	1 Toggenburg Doe
3 Berkshire Sows ..	2 Anglo-Nubian Rams
	1 Anglo-Nubian Doe.

FODDER AND PASTURE CROPS.

Experimental work is being conducted with fodder and pasture crops to determine if it is possible to improve the pasture conditions in the Island. For this purpose a number of varieties of such crops have been imported abroad.

BEEF CATTLE SLAUGHTER INVESTIGATION.

To determine the dressing percentage and the weights of the various cuts of the beef, an investigation was conducted with six representative beef animals at the Abattoir, Kingston. The animals were weighed before slaughter and the weights of the various cuts after the animals had been slaughtered were determined. In the second investigation, the carcass weights of 21 steers were taken.

I was called up for Military Service with my Unit (Jamaica Engineer Corps) on August 24th and remained in Active Service until September 15th, when I was ordered to take over the duties of Live Stock Officer in charge of Live Stock Division.

In conclusion I would like to express my appreciation on the way the Staff of the Live Stock Division have worked in order to get the Live Stock Improvement Centres established. It is due to their efforts that it was possible to have 30 Live Stock Improvement Centres established within a matter of 6 months after the Live Stock Division was organized.

J. W. HOWE,
Live Stock Officer.
September 10, 190

APPENDIX 2.

Annual Report, Sugar Control Board 1939-40.

INTRODUCTION.

The initial export quota for the quota period 1st September, 1938, to 31st August, 1939, was 80,360 tons, which subsequently increased to 109,960 tons. The production figures for the 1938-39 crop are as follows:—

Sugar Exported	105,792 tons
Local Consumption	14,000 "
Total production	117,945.6 "
Muscovado production	66.4 "

The Export Quota allotted to Jamaica for the 1939-40 crop is 102,000 tons.

At the outbreak of War the International Sugar Agreement fell into abeyance although it is still operative. Permission was given to the Colony to increase its quota by 20 per cent. The United Kingdom Food Controller raised the whole of the crop at a fixed price.

2. REGISTRATION OF CANE FARMERS.

As a result of the new conditions, the Board recommended to Government that the restrictions in regard to cane farmers who were not registered in 1937-38 when the International Agreement came into operation were relaxed. Cane farmers who applied for registration and from whom the factory concerned would accept cane have been entered. Under the Sugar Industry Control Law these farmers are not entitled to a basic quota and the factory refuse to accept delivery of their cane in subsequent crops. Owing to the reduction of the quota in 1938-39, it is necessary to issue licences to cane farmers restricting their deliveries to a proportion defined under the Law to deliveries in 1937-38. Licenced farmers were permitted to deliver in excess of their licensed quantity provided the factory was prepared to accept that excess.

During the period under review, six hundred and seventy cane farmers were registered, making a total of six hundred and four hundred.

3. PRICE OF CANE.

Early in the year representations were made to the Board in regard to the prices paid to cane farmers for their cane.

The Board received deputations both from certain sections of cane farmers and from the Sugar Manufacturers' Association and proceeded to investigate the matter in some detail. It was found that there was no general basis for determining the prices paid for cane in operation throughout the island. Representations were made to the manufacturers during the 1939 crop and they made what adjustments were practicable at that time to enable payment to be made on a uniform basis. Before the 1940 crop, sugar manufacturers had devised a scale of payment which would be applicable to all factories throughout the island and was based on the average quality of the cane delivered to the factory. The proposals were accepted by the Sugar Control Board and were adopted by all manufacturers who had facilities with which to test their cane.

4. REGULATIONS CONTROLLING SCALES.

During the 1939 crop the Board directed attention to the accuracy of the scales used for the purchase of cane. A series of tests were made on behalf of the Board. The Board concluded that the regulations controlling the testing of such scales were inadequate and did not provide proper safeguard for either the cane farmer or the manufacturer. Proposals for the basis of new regulations have therefore been drafted and submitted to Government.

5. PREFERENCE CERTIFICATES.

The question of the allocation of Preference Certificates among manufacturers received the attention of the Board. The approval of the Secretary of State has been received for the use of a revised method of allocation which is considered to be more equitable than that previously in use.

The Sugar Control Board has held sixteen meetings during the period under review.

H. H. CROUCHER,
Secretary.

3th September, 1940.

1/6



